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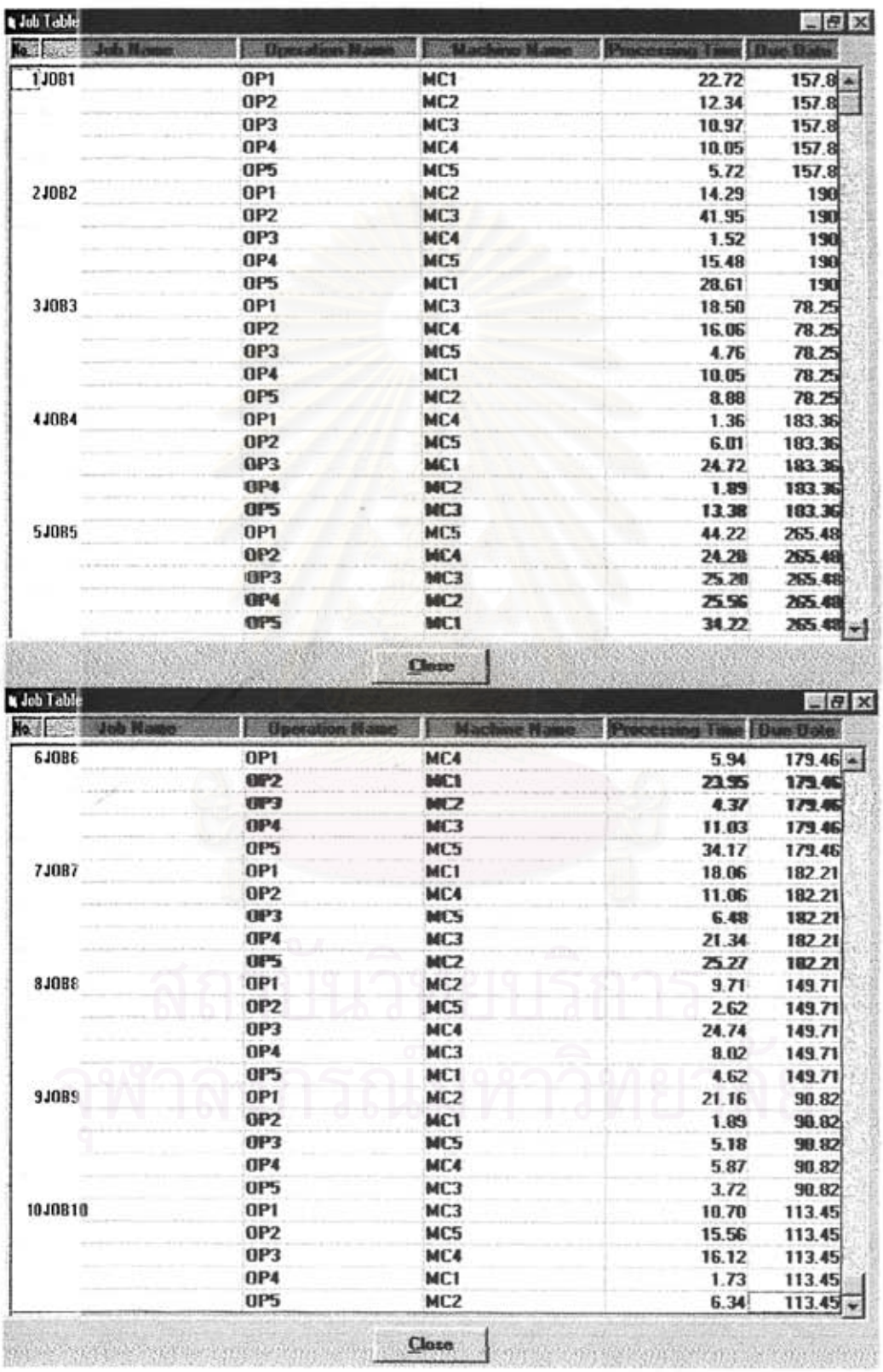
ภาคผนวก ก

รายละเอียดของงานและการทำงานเพื่อเป็นข้อมูลเข้า (Input) สำหรับโปรแกรมการจัดตาราง / การเปลี่ยนตารางการผลิต ประกอบไปด้วยกรณีศึกษา 10 กรณี คือ Case 1 - Case 10 ดังมีรายละเอียดดังตารางที่ ก.1 – ก.10

ตารางที่ ก.1 รายละเอียดเพื่อการจัดตารางของกรณีศึกษา : CASE1



Job Table

No.	Job Name	Operation Name	Machine Name	Processing Time	Due Date
1	JOB1	OP1	MC1	22.72	157.8
		OP2	MC2	12.34	157.8
		OP3	MC3	10.97	157.8
		OP4	MC4	10.05	157.8
		OP5	MC5	5.72	157.8
2	JOB2	OP1	MC2	14.29	190
		OP2	MC3	41.95	190
		OP3	MC4	1.52	190
		OP4	MC5	15.48	190
		OP5	MC1	28.61	190
3	JOB3	OP1	MC3	18.50	78.25
		OP2	MC4	16.06	78.25
		OP3	MC5	4.76	78.25
		OP4	MC1	10.05	78.25
		OP5	MC2	8.88	78.25
4	JOB4	OP1	MC4	1.36	183.36
		OP2	MC5	6.01	183.36
		OP3	MC1	24.72	183.36
		OP4	MC2	1.89	183.36
		OP5	MC3	13.38	183.36
5	JOB5	OP1	MC5	44.22	265.48
		OP2	MC4	24.28	265.48
		OP3	MC3	25.20	265.48
		OP4	MC2	25.56	265.48
		OP5	MC1	34.22	265.48

Close

Job Table

No.	Job Name	Operation Name	Machine Name	Processing Time	Due Date
6	JOB6	OP1	MC4	5.94	179.46
		OP2	MC1	23.95	179.46
		OP3	MC2	4.37	179.46
		OP4	MC3	11.03	179.46
		OP5	MC5	34.17	179.46
7	JOB7	OP1	MC1	18.06	182.21
		OP2	MC4	11.06	182.21
		OP3	MC5	6.48	182.21
		OP4	MC3	21.34	182.21
		OP5	MC2	25.27	182.21
8	JOB8	OP1	MC2	9.71	149.71
		OP2	MC5	2.62	149.71
		OP3	MC4	24.74	149.71
		OP4	MC3	8.02	149.71
		OP5	MC1	4.62	149.71
9	JOB9	OP1	MC2	21.16	90.82
		OP2	MC1	1.89	90.82
		OP3	MC5	5.18	90.82
		OP4	MC4	5.87	90.82
		OP5	MC3	3.72	90.82
10	JOB10	OP1	MC3	10.70	113.45
		OP2	MC5	15.56	113.45
		OP3	MC4	16.12	113.45
		OP4	MC1	1.73	113.45
		OP5	MC2	6.34	113.45

Close

ตารางที่ ก.2 รายละเอียดเพื่อการจัดตารางของกรณีศึกษา : CASE2

Job Table

No.	Job Name	Operation Name	Machine Name	Processing Time	Due Date
1	JOB1	OP1	MC5	1.72	93.45
		OP2	MC2	14.77	93.45
		OP3	MC1	15.54	93.45
		OP4	MC3	1.85	93.45
		OP5	MC4	14.57	93.45
2	JOB2	OP1	MC1	7.71	62.97
		OP2	MC2	18.17	62.97
		OP3	MC3	3.57	62.97
		OP4	MC4	1.21	62.97
		OP5	MC5	2.31	62.97
3	JOB3	OP1	MC2	5.25	65.97
		OP2	MC1	11.28	65.97
		OP3	MC4	4.18	65.97
		OP4	MC3	9.24	65.97
		OP5	MC5	8.02	65.97
4	JOB4	OP1	MC5	3.30	67.38
		OP2	MC4	12.08	67.38
		OP3	MC3	19.22	67.38
		OP4	MC2	10.28	67.38
		OP5	MC1	2.50	67.38
5	JOB5	OP1	MC4	3.28	147.39
		OP2	MC1	8.06	147.39
		OP3	MC2	6.31	147.39
		OP4	MC3	24.46	147.39
		OP5	MC5	5.28	147.39

Close

Job Table

No.	Job Name	Operation Name	Machine Name	Processing Time	Due Date
6	JOB6	OP1	MC3	3.29	74.71
		OP2	MC5	5.96	74.71
		OP3	MC1	13.99	74.71
		OP4	MC4	9.94	74.71
		OP5	MC2	1.53	74.71
7	JOB7	OP1	MC1	2.65	155.97
		OP2	MC5	9.09	155.97
		OP3	MC2	31.04	155.97
		OP4	MC3	6.15	155.97
		OP5	MC4	7.04	155.97
8	JOB8	OP1	MC2	3.46	158.06
		OP6	MC5	19.01	158.06
		OP7	MC1	4.23	158.06
		OP8	MC3	23.43	158.06
		OP1	MC4	7.93	158.06
9	JOB9	OP2	MC4	6.97	139.94
		OP3	MC5	11.44	139.94
		OP4	MC3	21.17	139.94
		OP5	MC2	3.51	139.94
		OP6	MC1	16.85	139.94
10	JOB10	OP7	MC3	11.86	87.42
		OP8	MC4	12.77	87.42
		OP9	MC2	15.42	87.42
		OP10	MC5	7.37	87.42
		OP1	MC1	6.78	87.42

Close

ตารางที่ ก.3 รายละเอียดเพื่อการจัดตารางของกรณีศึกษา : CASE3

Job Table

No.	Job Name	Operation Name	Machine Name	Processing Time	Due Date
1	JOB1	OP1	MC5	4.81	138.68
		OP2	MC4	11.65	138.68
		OP3	MC3	24.09	138.68
		OP4	MC2	5.63	138.68
		OP5	MC1	12.50	138.68
2	JOB2	OP1	MC2	2.44	131.32
		OP2	MC1	2.87	131.32
		OP3	MC5	13.18	131.32
		OP4	MC4	21.86	131.32
		OP5	MC3	10.97	131.32
3	JOB3	OP1	MC1	49.25	160.63
		OP2	MC2	2.17	160.63
		OP3	MC3	13.19	160.63
		OP4	MC4	36.59	160.63
		OP5	MC5	9.43	160.63
4	JOB4	OP1	MC3	1.63	76.8
		OP2	MC4	10.81	76.8
		OP3	MC1	2.34	76.8
		OP4	MC2	2.14	76.8
		OP5	MC5	19.88	76.8
5	JOB5	OP1	MC4	1.94	89.72
		OP2	MC1	13.80	89.72
		OP3	MC2	4.90	89.72
		OP4	MC3	7.46	89.72
		OP5	MC5	11.62	89.72

Close

Job Table

No.	Job Name	Operation Name	Machine Name	Processing Time	Due Date
6	JOB6	OP1	MC1	4.81	63.23
		OP2	MC5	4.25	63.23
		OP3	MC2	11.75	63.23
		OP4	MC3	37.76	63.23
		OP5	MC4	4.66	63.23
7	JOB7	OP1	MC2	8.53	199.31
		OP2	MC1	5.68	199.31
		OP3	MC5	36.47	199.31
		OP4	MC4	25.98	199.31
		OP5	MC3	2.65	199.31
8	JOB8	OP1	MC3	5.03	132.6
		OP2	MC5	4.16	132.6
		OP3	MC4	15.78	132.6
		OP4	MC2	38.12	132.6
		OP5	MC1	9.51	132.6
9	JOB9	OP1	MC4	6.60	126.78
		OP2	MC3	4.45	126.78
		OP3	MC2	32.25	126.78
		OP4	MC1	15.49	126.78
		OP5	MC5	1.99	126.78
10	JOB10	OP1	MC5	30.60	203.46
		OP2	MC3	33.78	203.46
		OP3	MC4	8.14	203.46
		OP4	MC2	16.48	203.46
		OP5	MC1	14.46	203.46

Close

ตารางที่ ก.4 รายละเอียดเพื่อการจัดตารางของกรณีศึกษา : CASE4

Job Table

No.	Job Name	Operation Name	Machine Name	Processing Time	Due Date
1	JOB1	OP1	MC5	3.90	94.06
		OP2	MC4	7.81	94.06
		OP3	MC3	21.06	94.06
		OP4	MC2	5.09	94.06
		OP5	MC1	6.20	94.06
2	JOB2	OP1	MC4	3.38	98.18
		OP2	MC5	29.87	98.18
		OP3	MC1	1.99	98.18
		OP4	MC2	5.89	98.18
		OP5	MC3	7.05	98.18
3	JOB3	OP1	MC4	2.94	74.46
		OP2	MC2	12.29	74.46
		OP3	MC3	3.19	74.46
		OP4	MC1	7.38	74.46
		OP5	MC5	18.66	74.46
4	JOB4	OP1	MC1	14.17	79.25
		OP2	MC2	15.75	79.25
		OP3	MC4	1.32	79.25
		OP4	MC5	11.36	79.25
		OP5	MC3	6.65	79.25
5	JOB5	OP1	MC3	15.43	145.21
		OP2	MC4	1.77	145.21
		OP3	MC5	20.65	145.21
		OP4	MC1	3.57	145.21
		OP5	MC2	3.79	145.21

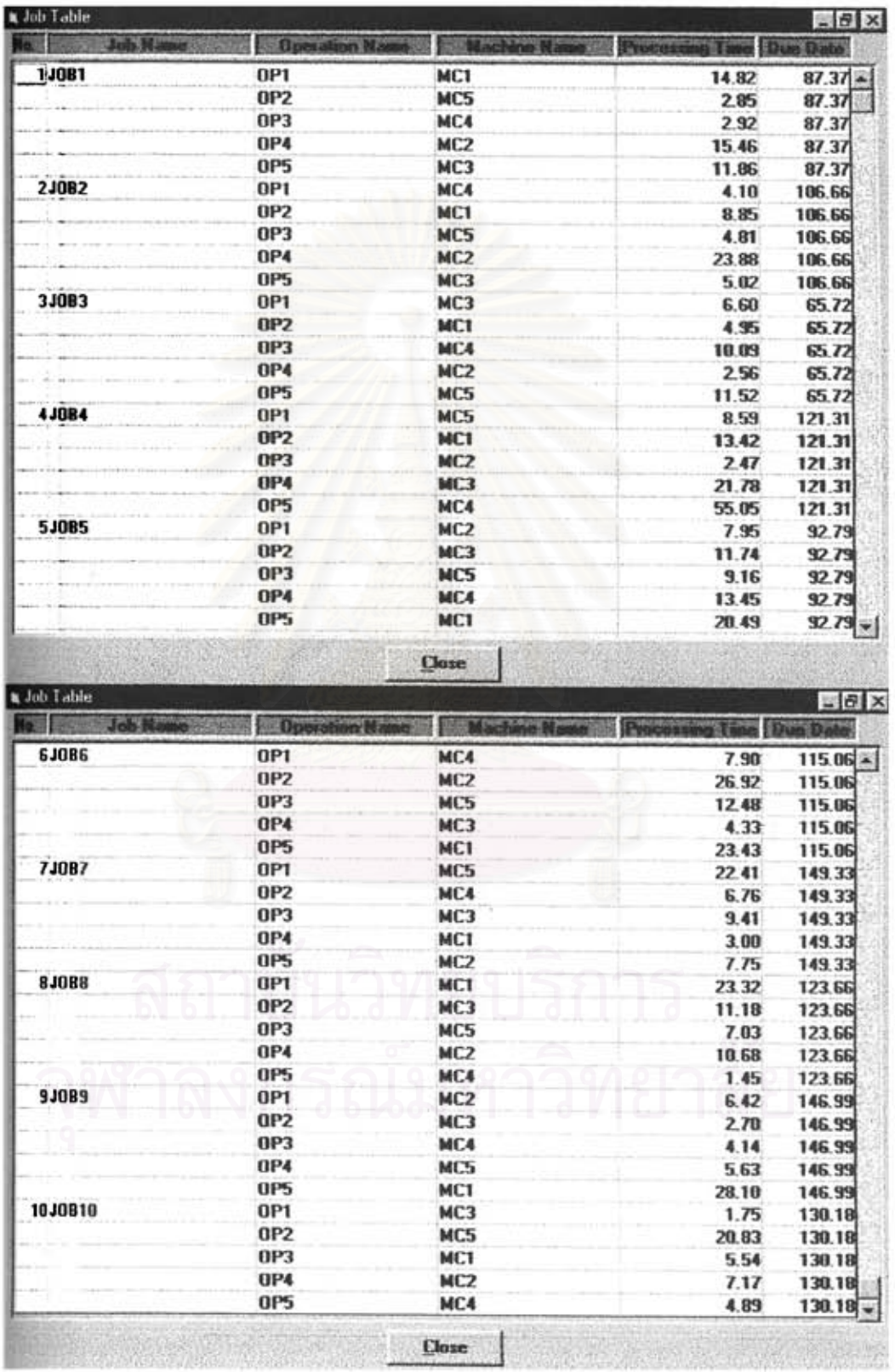
Close

Job Table

No.	Job Name	Operation Name	Machine Name	Processing Time	Due Date
6	JOB6	OP1	MC5	4.54	102.57
		OP2	MC1	3.64	102.57
		OP3	MC2	12.16	102.57
		OP4	MC3	8.07	102.57
		OP5	MC4	4.16	102.57
7	JOB7	OP1	MC3	9.65	172.71
		OP2	MC5	1.59	172.71
		OP3	MC2	32.67	172.71
		OP4	MC4	22.99	172.71
		OP5	MC1	5.81	172.71
8	JOB8	OP1	MC1	15.62	93.4
		OP2	MC2	7.08	93.4
		OP3	MC3	3.09	93.4
		OP4	MC4	26.41	93.4
		OP5	MC5	1.20	93.4
9	JOB9	OP1	MC2	30.81	169.23
		OP2	MC5	15.98	169.23
		OP3	MC1	11.99	169.23
		OP4	MC3	7.68	169.23
		OP5	MC4	2.77	169.23
10	JOB10	OP1	MC2	3.89	104.07
		OP2	MC5	2.49	104.07
		OP3	MC3	12.77	104.07
		OP4	MC1	25.21	104.07
		OP5	MC4	9.71	104.07

Close

ตารางที่ ก.5 รายละเอียดเพื่อการจัดตารางของกรณีศึกษา : CASE5



Job Table

No.	Job Name	Operation Name	Machine Name	Processing Time	Due Date
1	J0B1	OP1	MC1	14.82	87.37
		OP2	MC5	2.85	87.37
		OP3	MC4	2.92	87.37
		OP4	MC2	15.46	87.37
		OP5	MC3	11.06	87.37
2	J0B2	OP1	MC4	4.10	106.66
		OP2	MC1	8.85	106.66
		OP3	MC5	4.81	106.66
		OP4	MC2	23.88	106.66
		OP5	MC3	5.02	106.66
3	J0B3	OP1	MC3	6.60	65.72
		OP2	MC1	4.95	65.72
		OP3	MC4	10.09	65.72
		OP4	MC2	2.56	65.72
		OP5	MC5	11.52	65.72
4	J0B4	OP1	MC5	8.59	121.31
		OP2	MC1	13.42	121.31
		OP3	MC2	2.47	121.31
		OP4	MC3	21.78	121.31
		OP5	MC4	55.05	121.31
5	J0B5	OP1	MC2	7.95	92.79
		OP2	MC3	11.74	92.79
		OP3	MC5	9.16	92.79
		OP4	MC4	13.45	92.79
		OP5	MC1	28.49	92.79

Close

Job Table

No.	Job Name	Operation Name	Machine Name	Processing Time	Due Date
6	J0B6	OP1	MC4	7.90	115.06
		OP2	MC2	26.92	115.06
		OP3	MC5	12.48	115.06
		OP4	MC3	4.33	115.06
		OP5	MC1	23.43	115.06
7	J0B7	OP1	MC5	22.41	149.33
		OP2	MC4	6.76	149.33
		OP3	MC3	9.41	149.33
		OP4	MC1	3.00	149.33
		OP5	MC2	7.75	149.33
8	J0B8	OP1	MC1	23.32	123.66
		OP2	MC3	11.18	123.66
		OP3	MC5	7.03	123.66
		OP4	MC2	10.68	123.66
		OP5	MC4	1.45	123.66
9	J0B9	OP1	MC2	6.42	146.99
		OP2	MC3	2.70	146.99
		OP3	MC4	4.14	146.99
		OP4	MC5	5.63	146.99
		OP5	MC1	28.10	146.99
10	J0B10	OP1	MC3	1.75	130.18
		OP2	MC5	20.83	130.18
		OP3	MC1	5.54	130.18
		OP4	MC2	7.17	130.18
		OP5	MC4	4.89	130.18

Close

ตารางที่ ก.6 รายละเอียดเพื่อการจัดตารางของกรณีศึกษา : CASE6

Job Table

No.	Job Name	Operation Name	Machine Name	Processing Time	Due Date
1	JOB1	OP1	MC1	5.09	67.12
		OP2	MC2	3.24	67.12
		OP3	MC3	3.58	67.12
		OP4	MC4	4.22	67.12
		OP5	MC5	7.07	67.12
2	JOB2	OP1	MC1	8.44	102.89
		OP2	MC5	3.25	102.89
		OP3	MC4	5.11	102.89
		OP4	MC3	3.01	102.89
		OP5	MC2	23.08	102.89
3	JOB3	OP1	MC2	6.23	76.48
		OP2	MC3	3.03	76.48
		OP3	MC4	4.21	76.48
		OP4	MC5	18.07	76.48
		OP5	MC1	4.94	76.48
4	JOB4	OP1	MC2	17.32	75.67
		OP2	MC1	2.04	75.67
		OP3	MC5	8.88	75.67
		OP4	MC4	12.20	75.67
		OP5	MC3	5.23	75.67
5	JOB5	OP1	MC3	18.24	146.58
		OP2	MC4	16.91	146.58
		OP3	MC5	5.18	146.58
		OP4	MC1	34.28	146.58
		OP5	MC2	4.97	146.58

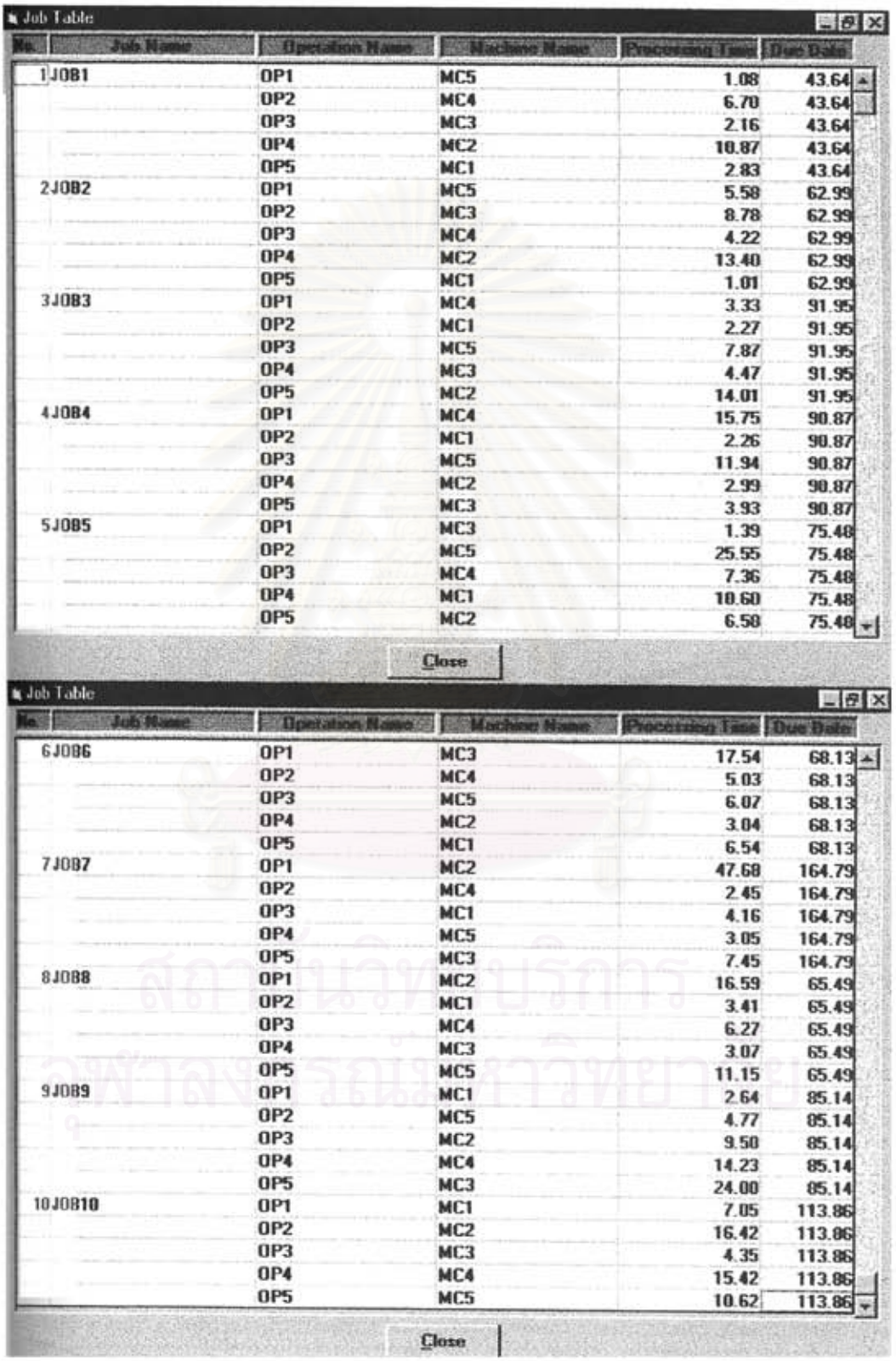
Close

Job Table

No.	Job Name	Operation Name	Machine Name	Processing Time	Due Date
6	JOB6	OP1	MC3	2.81	64.66
		OP2	MC5	1.58	64.66
		OP3	MC1	2.49	64.66
		OP4	MC2	9.27	64.66
		OP5	MC4	8.51	64.66
7	JOB7	OP1	MC3	11.21	81.97
		OP2	MC5	3.54	81.97
		OP3	MC1	20.18	81.97
		OP4	MC2	2.09	81.97
		OP5	MC4	4.95	81.97
8	JOB8	OP1	MC4	35.53	77.85
		OP2	MC3	1.83	77.85
		OP3	MC1	10.93	77.85
		OP4	MC2	12.77	77.85
		OP5	MC5	6.89	77.85
9	JOB9	OP1	MC5	4.96	95.51
		OP2	MC4	4.23	95.51
		OP3	MC3	11.48	95.51
		OP4	MC2	5.58	95.51
		OP5	MC1	9.26	95.51
10	JOB10	OP1	MC5	1.60	88.68
		OP2	MC1	2.76	88.68
		OP3	MC2	22.15	88.68
		OP4	MC3	6.76	88.68
		OP5	MC4	5.41	88.68

Close

ตารางที่ ก.7 รายละเอียดเพื่อการจัดตารางของกรณีศึกษา :: CASE7



Job Table

No.	Job Name	Operation Name	Machine Name	Processing Time	Due Date
1	JOB1	OP1	MC5	1.08	43.64
		OP2	MC4	6.70	43.64
		OP3	MC3	2.16	43.64
		OP4	MC2	10.87	43.64
		OP5	MC1	2.83	43.64
2	JOB2	OP1	MC5	5.58	62.99
		OP2	MC3	8.78	62.99
		OP3	MC4	4.22	62.99
		OP4	MC2	13.40	62.99
		OP5	MC1	1.01	62.99
3	JOB3	OP1	MC4	3.33	91.95
		OP2	MC1	2.27	91.95
		OP3	MC5	7.87	91.95
		OP4	MC3	4.47	91.95
		OP5	MC2	14.01	91.95
4	JOB4	OP1	MC4	15.75	90.87
		OP2	MC1	2.26	90.87
		OP3	MC5	11.94	90.87
		OP4	MC2	2.99	90.87
		OP5	MC3	3.93	90.87
5	JOB5	OP1	MC3	1.39	75.48
		OP2	MC5	25.55	75.48
		OP3	MC4	7.36	75.48
		OP4	MC1	10.60	75.48
		OP5	MC2	6.58	75.48

Close

Job Table

No.	Job Name	Operation Name	Machine Name	Processing Time	Due Date
6	JOB6	OP1	MC3	17.54	68.13
		OP2	MC4	5.03	68.13
		OP3	MC5	6.07	68.13
		OP4	MC2	3.04	68.13
		OP5	MC1	6.54	68.13
7	JOB7	OP1	MC2	47.68	164.79
		OP2	MC4	2.45	164.79
		OP3	MC1	4.16	164.79
		OP4	MC5	3.05	164.79
		OP5	MC3	7.45	164.79
8	JOB8	OP1	MC2	16.59	65.49
		OP2	MC1	3.41	65.49
		OP3	MC4	6.27	65.49
		OP4	MC3	3.07	65.49
		OP5	MC5	11.15	65.49
9	JOB9	OP1	MC1	2.64	85.14
		OP2	MC5	4.77	85.14
		OP3	MC2	9.50	85.14
		OP4	MC4	14.23	85.14
		OP5	MC3	24.00	85.14
10	JOB10	OP1	MC1	7.05	113.86
		OP2	MC2	16.42	113.86
		OP3	MC3	4.35	113.86
		OP4	MC4	15.42	113.86
		OP5	MC5	10.62	113.86

Close

ตารางที่ ก.8 รายละเอียดเพื่อการจัดตารางของกรณีศึกษา : CASE8

Job Table

No.	Job Name	Operation Name	Machine Name	Processing Time	Due Date
1	JOB1	OP1	MC1	19.78	118.95
		OP2	MC5	1.03	118.95
		OP3	MC2	25.20	118.95
		OP4	MC3	4.29	118.95
		OP5	MC4	8.65	118.95
2	JOB2	OP1	MC1	2.22	46.11
		OP2	MC2	12.95	46.11
		OP3	MC3	12.16	46.11
		OP4	MC4	2.72	46.11
		OP5	MC5	6.06	46.11
3	JOB3	OP1	MC5	7.07	80.34
		OP2	MC4	4.64	80.34
		OP3	MC3	3.64	80.34
		OP4	MC2	9.78	80.34
		OP5	MC1	13.21	80.34
4	JOB4	OP1	MC5	3.48	109.02
		OP2	MC1	19.54	109.02
		OP3	MC2	9.39	109.02
		OP4	MC3	4.84	109.02
		OP5	MC4	21.77	109.02
5	JOB5	OP1	MC4	4.88	61.96
		OP2	MC1	17.14	61.96
		OP3	MC2	3.08	61.96
		OP4	MC5	6.78	61.96
		OP5	MC3	5.08	61.96

Close

Job Table

No.	Job Name	Operation Name	Machine Name	Processing Time	Due Date
6	JOB6	OP1	MC4	2.07	48.24
		OP2	MC3	5.17	48.24
		OP3	MC5	2.14	48.24
		OP4	MC2	5.56	48.24
		OP5	MC1	5.30	48.24
7	JOB7	OP1	MC3	4.39	38.4
		OP2	MC4	3.43	38.4
		OP3	MC1	1.30	38.4
		OP4	MC5	1.05	38.4
		OP5	MC2	7.23	38.4
8	JOB8	OP1	MC3	1.60	25.43
		OP2	MC4	3.77	25.43
		OP3	MC2	5.01	25.43
		OP4	MC5	5.73	25.43
		OP5	MC1	1.32	25.43
9	JOB9	OP1	MC2	20.20	171.02
		OP2	MC4	10.29	171.02
		OP3	MC3	3.30	171.02
		OP4	MC5	11.75	171.02
		OP5	MC1	25.48	171.02
10	JOB10	OP1	MC2	6.72	142.28
		OP2	MC1	20.18	142.28
		OP3	MC5	7.64	142.28
		OP4	MC3	2.29	142.28
		OP5	MC4	5.45	142.28

Close

ตารางที่ ก.9 รายละเอียดเพื่อการจัดตารางของกรณีศึกษา : CASE9

Job Table

No.	Job Name	Operation Name	Machine Name	Processing Time	Due Date
1	JOB1	OP1	MC4	17.68	79.34
		OP2	MC5	4.17	79.34
		OP3	MC1	8.43	79.34
		OP4	MC2	10.01	79.34
		OP5	MC3	9.05	79.34
2	JOB2	OP1	MC4	13.48	70.77
		OP2	MC2	3.38	70.77
		OP3	MC3	10.76	70.77
		OP4	MC5	12.21	70.77
		OP5	MC1	10.94	70.77
3	JOB3	OP1	MC2	23.14	74.54
		OP2	MC5	10.36	74.54
		OP3	MC1	4.57	74.54
		OP4	MC4	6.22	74.54
		OP5	MC3	10.25	74.54
4	JOB4	OP1	MC2	1.89	29.3
		OP2	MC3	7.65	29.3
		OP3	MC4	3.90	29.3
		OP4	MC5	4.23	29.3
		OP5	MC1	1.63	29.3
5	JOB5	OP1	MC5	2.93	72.66
		OP2	MC3	12.76	72.66
		OP3	MC1	4.09	72.66
		OP4	MC2	6.94	72.66
		OP5	MC4	11.94	72.66

Close

Job Table

No.	Job Name	Operation Name	Machine Name	Processing Time	Due Date
6	JOB6	OP1	MC5	4.77	90.2
		OP2	MC4	5.99	90.2
		OP3	MC3	15.04	90.2
		OP4	MC2	18.36	90.2
		OP5	MC1	1.04	90.2
7	JOB7	OP1	MC3	9.31	208.57
		OP2	MC1	15.33	208.57
		OP3	MC2	2.08	208.57
		OP4	MC4	58.45	208.57
		OP5	MC5	3.40	208.57
8	JOB8	OP1	MC3	21.13	180.69
		OP2	MC4	39.76	180.69
		OP3	MC1	9.09	180.69
		OP4	MC2	7.71	180.69
		OP5	MC5	3.00	180.69
9	JOB9	OP1	MC1	5.24	84.18
		OP2	MC2	1.22	84.18
		OP3	MC3	3.80	84.18
		OP4	MC4	6.44	84.18
		OP5	MC5	17.48	84.18
10	JOB10	OP1	MC1	2.95	137.4
		OP2	MC4	35.58	137.4
		OP3	MC5	8.26	137.4
		OP4	MC3	6.94	137.4
		OP5	MC2	13.67	137.4

Close

ตารางที่ ก.10 รายละเอียดเพื่อการจัดตารางของกรณีศึกษา : CASE10

Job Table

No.	Job Name	Operation Name	Machine Name	Processing Time	Due Date
1	JOB1	OP1	MC5	9.43	118.64
		OP2	MC4	4.46	118.64
		OP3	MC3	15.89	118.64
		OP4	MC2	5.96	118.64
		OP5	MC1	17.90	118.64
2	JOB2	OP1	MC1	6.14	109.11
		OP2	MC2	25.27	109.11
		OP3	MC3	7.82	109.11
		OP4	MC4	8.07	109.11
		OP5	MC5	3.81	109.11
3	JOB3	OP1	MC5	3.33	105.09
		OP2	MC2	7.36	105.09
		OP3	MC3	9.68	105.09
		OP4	MC4	11.54	105.09
		OP5	MC1	3.18	105.09
4	JOB4	OP1	MC2	10.02	106.5
		OP2	MC4	6.54	106.5
		OP3	MC3	10.27	106.5
		OP4	MC1	10.39	106.5
		OP5	MC5	9.28	106.5
5	JOB5	OP1	MC1	15.64	130.31
		OP2	MC5	7.92	130.31
		OP3	MC4	7.51	130.31
		OP4	MC3	11.18	130.31
		OP5	MC2	14.06	130.31

Close

Job Table

No.	Job Name	Operation Name	Machine Name	Processing Time	Due Date
6	JOB6	OP1	MC4	42.04	181.09
		OP2	MC1	10.74	181.09
		OP3	MC5	9.16	181.09
		OP4	MC3	2.17	181.09
		OP5	MC2	56.98	181.09
7	JOB7	OP1	MC2	13.59	157.41
		OP2	MC1	2.12	157.41
		OP3	MC4	7.55	157.41
		OP4	MC3	39.53	157.41
		OP5	MC5	4.62	157.41
8	JOB8	OP1	MC3	3.51	89.81
		OP2	MC2	9.73	89.81
		OP3	MC1	7.72	89.81
		OP4	MC4	1.23	89.81
		OP5	MC5	27.62	89.81
9	JOB9	OP1	MC3	2.63	52.7
		OP2	MC4	2.59	52.7
		OP3	MC1	6.34	52.7
		OP4	MC5	4.07	52.7
		OP5	MC2	12.07	52.7
10	JOB10	OP1	MC4	7.00	147.06
		OP2	MC5	11.29	147.06
		OP3	MC1	4.60	147.06
		OP4	MC2	31.28	147.06
		OP5	MC3	2.89	147.06

Close

ภาคผนวก ข

ผลการทดสอบการทำงานของโปรแกรมกับกรณีศึกษาของการจัดตารางการผลิต ประกอบไปด้วย กรณีศึกษา 10 กรณี คือ Case 1 - Case 10 ดังมีรายละเอียดดังตารางที่ ข.1 - ข.10

ตารางที่ ข.1 ผลการจัดตารางโดยใช้ Scheduling Algorithm : EDD

CASE	Option	Scheduling				
		Flowtime	Lateness	Tardiness	Tardy Jobs	Utilization
CASE 1	Active	147.24	-11.81	12.9	3	0.56
	Non delay	160.71	1.65	12.9	5	0.63
CASE 2	Active	104.22	-1.1	5.2	3	0.63
	Non delay	127.18	21.85	25.9	6	0.47
CASE 3	Active	143.15	10.9	19.7	5	0.54
	Non delay	138.44	6.19	9.4	5	0.6
CASE 4	Active	121.13	7.82	14.9	7	0.55
	Non delay	105.57	-7.74	5.4	4	0.68
CASE 5	Active	148.63	34.72	41.8	6	0.49
	Non delay	132.65	18.74	29.9	6	0.6
CASE 6	Active	91.4	3.66	14.2	7	0.58
	Non delay	97.21	9.46	13.7	6	0.69
CASE 7	Active	103.68	17.44	21.3	7	0.42
	Non delay	120.16	33.93	37.5	7	0.51
CASE 8	Active	80.37	-3.8	3.5	3	0.58
	Non delay	86.73	2.55	8.1	7	0.64
CASE 9	Active	115.84	13.07	15.6	8	0.54
	Non delay	106.19	3.43	11	5	0.58
CASE 10	Active	110.26	-9.52	5.1	3	0.66
	Non delay	108.78	-11	8.2	2	0.7
	MAX	160.71	34.72	41.8	8	0.7
	MIN	80.37	-11.81	3.5	2	0.42
	AVG	117.477	7.022	15.81	5.25	0.5825
	STD	22.1806	13.4613	10.7241	1.7434	0.0752

ตารางที่ ข.2 ผลการจัดตารางโดยใช้ Scheduling Algorithm : SPT

CASE	Option	Scheduling				
		Flowtime	Lateness	Tardiness	Tardy Jobs	Utilization
CASE 1	Active	151.94	-7.12	16.4	3	0.57
	Non delay	165.45	6.4	24.5	5	0.6
CASE 2	Active	115.09	9.76	16.2	5	0.6
	Non delay	106.28	0.96	10.3	4	0.66
CASE 3	Active	156.88	24.63	37	6	0.48
	Non delay	156.53	24.28	39.4	6	0.57
CASE 4	Active	131.19	17.88	28.9	7	0.47
	Non delay	123.62	10.31	19.6	8	0.57
CASE 5	Active	127.68	13.77	23.9	5	0.56
	Non delay	124.59	10.68	23.5	5	0.58
CASE 6	Active	98.2	10.46	19.6	5	0.48
	Non delay	104.06	16.32	18.8	7	0.62
CASE 7	Active	102.88	16.65	21.2	6	0.45
	Non delay	93	6.77	13.6	5	0.57
CASE 8	Active	98.52	14.34	19.8	6	0.48
	Non delay	85.43	1.26	11.9	5	0.58
CASE 9	Active	117.58	14.82	17.7	6	0.5
	Non delay	142.09	39.32	47.6	7	0.53
CASE 10	Active	115.14	-4.63	8.4	5	0.61
	Non delay	118.59	-1.18	11.4	5	0.66
	MAX	165.45	39.32	47.6	8	0.66
	MIN	85.43	-7.12	8.4	3	0.45
	AVG	121.737	11.284	21.485	5.55	0.557
	STD	23.03103	10.91025	10.14382	1.145931	0.06250

ตารางที่ ข.3 ผลการจัดตารางโดยใช้ Scheduling Algorithm : LPT

CASE	Option	Scheduling				
		Flowtime	Lateness	Tardiness	Tardy Jobs	Utilization
CASE 1	Active	192.73	33.68	51.2	7	0.64
	Non delay	201.43	42.37	55.8	7	0.63
CASE 2	Active	138.34	33.02	40.3	8	0.54
	Non delay	145.74	40.42	47.3	9	0.57
CASE 3	Active	240.37	108.12	118.1	9	0.45
	Non delay	239.51	107.26	117.1	9	0.45
CASE 4	Active	162.66	49.35	56.6	9	0.59
	Non delay	164	50.68	56.7	8	0.63
CASE 5	Active	139.91	26	32.7	7	0.65
	Non delay	145.08	31.17	42.8	8	0.65
CASE 6	Active	117.23	29.49	29.9	8	0.66
	Non delay	118.02	30.28	35	8	0.6
CASE 7	Active	127.9	41.66	49.4	9	0.6
	Non delay	127.97	41.73	49.4	9	0.6
CASE 8	Active	118.56	34.39	48.6	6	0.57
	Non delay	114.83	30.65	48.9	6	0.55
CASE 9	Active	214.22	111.45	120	8	0.45
	Non delay	160.54	57.77	60.1	9	0.49
CASE 10	Active	153.63	33.86	35.8	9	0.57
	Non delay	153.63	33.86	35.8	9	0.57
	MAX	240.37	111.45	120	9	0.66
	MIN	114.83	26	29.9	6	0.45
	AVG	158.815	48.3605	56.575	8.1	0.573
	STD	39.2625	27.3015	27.9940	1.0208	0.0676

ตารางที่ ข.4 ผลการจัดตารางโดยใช้ Scheduling Algorithm : SDT

CASE	Option	Scheduling				
		Flowtime	Lateness	Tardiness	Tardy Jobs	Utilization
CASE 1	Active	212.59	53.53	64.1	7	0.48
	Non delay	168.1	9.05	29.6	5	0.65
CASE 2	Active	114.01	8.68	23.2	4	0.56
	Non delay	97.52	-7.8	10.2	5	0.66
CASE 3	Active	148.7	16.45	40.7	4	0.51
	Non delay	163.43	31.18	49.7	3	0.6
CASE 4	Active	114.02	0.7	13.2	4	0.59
	Non delay	123.97	10.66	16.6	6	0.59
CASE 5	Active	143.72	29.82	37	7	0.58
	Non delay	133.13	19.22	25.6	8	0.61
CASE 6	Active	101.64	13.9	21.9	6	0.49
	Non delay	105.87	18.12	29.8	5	0.54
CASE 7	Active	103.89	17.66	22.9	7	0.47
	Non delay	117.89	31.66	39.1	6	0.47
CASE 8	Active	103.14	18.97	28.6	7	0.54
	Non delay	106.04	21.87	33.3	5	0.55
CASE 9	Active	129.55	26.78	32.3	8	0.45
	Non delay	132.9	30.13	37.6	8	0.52
CASE 10	Active	133.8	14.03	21.1	6	0.62
	Non delay	138.8	19.03	30.09	7	0.68
	MAX	212.59	53.53	64.1	8	0.68
	MIN	97.52	-7.8	10.2	3	0.45
	AVG	129.6355	19.182	30.3295	5.9	0.558
	STD	28.23647	12.97371	12.53586	1.48324	0.06764

ตารางที่ ข.5 ผลการจัดตารางโดยใช้ Scheduling Algorithm : LDT

CASE	Option	Scheduling				
		Flowtime	Lateness	Tardiness	Tardy Jobs	Utilization
CASE 1	Active	165.43	6.38	22.7	6	0.67
	Non delay	190.71	31.66	44.6	7	0.61
CASE 2	Active	125.45	20.12	28	7	0.64
	Non delay	137.75	32.42	39.3	9	0.6
CASE 3	Active	230.4	98.15	108.1	9	0.49
	Non delay	222.28	90.02	100	9	0.49
CASE 4	Active	133.02	19.7	29.7	6	0.6
	Non delay	147.88	34.56	45.3	8	0.61
CASE 5	Active	147.37	33.46	47.4	6	0.56
	Non delay	141.41	27.51	41.1	6	0.65
CASE 6	Active	111.62	23.88	25.2	8	0.68
	Non delay	110.66	22.92	24.4	8	0.67
CASE 7	Active	126.75	40.51	45.2	9	0.57
	Non delay	127.17	40.94	47.2	9	0.55
CASE 8	Active	113.03	28.86	42	6	0.62
	Non delay	111.6	27.42	42.5	7	0.53
CASE 9	Active	173.58	70.81	81.3	8	0.45
	Non delay	174.13	71.36	80.2	9	0.47
CASE 10	Active	168.17	48.39	53.3	6	0.55
	Non delay	140.2	20.43	30.9	5	0.69
	MAX	230.4	98.15	108.1	9	0.69
	MIN	110.66	6.38	22.7	5	0.45
	AVG	149.9305	39.475	48.92	7.4	0.585
	STD	34.94234	24.48636	24.53175	1.353358	0.072729

ตารางที่ ข.6 ผลการจัดตารางโดยใช้ Scheduling Algorithm : SMT

CASE	Option	Scheduling				
		Flowtime	Lateness	Tardiness	Tardy Jobs	Utilization
CASE 1	Active	179.06	20	44.7	7	0.4
	Non delay	155.52	-3.53	24.4	6	0.53
CASE 2	Active	109.89	4.57	11.8	6	0.62
	Non delay	103.17	-2.16	9.6	5	0.62
CASE 3	Active	143.13	10.88	29	5	0.5
	Non delay	135.16	2.91	23.3	5	0.68
CASE 4	Active	114.38	1.07	14.6	5	0.61
	Non delay	120.5	7.19	25.8	7	0.55
CASE 5	Active	127.03	13.12	26.2	7	0.54
	Non delay	112.1	-1.8	14.1	3	0.68
CASE 6	Active	91.6	3.86	17.4	6	0.5
	Non delay	97.32	9.58	12.6	6	0.59
CASE 7	Active	97.95	11.72	23.9	6	0.46
	Non delay	88.85	2.62	9.8	6	0.56
CASE 8	Active	91.74	7.56	16.1	5	0.48
	Non delay	76.9	-7.28	10.4	5	0.57
CASE 9	Active	102.16	-0.6	6.3	4	0.59
	Non delay	112.6	9.84	20.1	4	0.55
CASE 10	Active	121.43	1.66	14.6	5	0.65
	Non delay	114.41	-5.36	13.1	5	0.69
	MAX	179.06	20	44.7	7	0.69
	MIN	76.9	-7.28	6.3	3	0.4
	AVG	114.745	4.2925	18.39	5.4	0.5685
	STD	24.42111	6.93685	8.984073	1.04629	0.07768

ตารางที่ ข.7 ผลการจัดตารางโดยใช้ Scheduling Algorithm : LMT

CASE	Option	Scheduling				
		Flowtime	Lateness	Tardiness	Tardy Jobs	Utilization
CASE 1	Active	198.51	39.45	53.8	6	0.64
	Non delay	210.16	51.11	66.9	7	0.6
CASE 2	Active	138.79	33.46	42.7	7	0.54
	Non delay	144.69	39.37	46.6	8	0.57
CASE 3	Active	241.7	109.45	119.6	9	0.45
	Non delay	243.67	111.42	121.3	9	0.45
CASE 4	Active	142.15	28.84	46.2	6	0.62
	Non delay	137.71	24.4	36.9	7	0.57
CASE 5	Active	158.04	44.13	48.9	7	0.59
	Non delay	142.03	28.12	46.5	6	0.59
CASE 6	Active	153.81	66.06	70.9	9	0.47
	Non delay	141.26	53.52	60.3	8	0.48
CASE 7	Active	128.46	42.23	47	8	0.6
	Non delay	128.46	42.23	47	8	0.6
CASE 8	Active	130.65	46.47	60	7	0.48
	Non delay	135.64	51.47	64.8	7	0.48
CASE 9	Active	212.11	109.34	119.4	8	0.44
	Non delay	160.39	57.62	70.7	8	0.5
CASE 10	Active	167.74	47.97	49.1	7	0.53
	Non delay	162.41	42.64	43.5	9	0.52
	MAX	243.67	111.42	121.3	9	0.64
	MIN	128.46	24.4	36.9	6	0.44
	AVG	163.919	53.465	63.105	7.55	0.536
	STD	36.85613	26.38307	26.383098	0.99868	0.06394

ตารางที่ ข.8 ผลการจัดตารางโดยใช้ Scheduling Algorithm : SLACK

CASE	Option	Scheduling				
		Flowtime	Lateness	Tardiness	Tardy Jobs	Utilization
CASE 1	Active	143.54	-15.52	11.2	3	0.54
	Non delay	168.8	9.75	20.9	4	0.6
CASE 2	Active	111.68	6.35	13.4	7	0.62
	Non delay	116.86	11.53	17.3	8	0.61
CASE 3	Active	156.4	24.14	29.7	5	0.46
	Non delay	160.56	28.31	30.8	7	0.5
CASE 4	Active	116.69	3.38	14.1	5	0.59
	Non delay	110.56	-2.75	8	6	0.69
CASE 5	Active	143.64	29.73	36.9	6	0.56
	Non delay	132.65	18.74	29.9	6	0.6
CASE 6	Active	99.42	11.68	17	6	0.6
	Non delay	98.94	11.2	12	8	0.68
CASE 7	Active	103.68	17.44	21.3	7	0.42
	Non delay	110.16	23.93	31.4	6	0.53
CASE 8	Active	80.37	-3.8	3.5	3	0.58
	Non delay	87.5	3.32	15.7	7	0.63
CASE 9	Active	116.37	13.6	15.5	7	0.55
	Non delay	117.74	14.98	18.1	7	0.54
CASE 10	Active	128.16	8.39	13	7	0.69
	Non delay	126.9	7.13	11.2	5	0.69
	MAX	168.8	29.73	36.9	8	0.69
	MIN	80.37	-15.52	3.5	3	0.42
	AVG	121.531	11.0765	18.545	6	0.584
	STD	23.7822189	11.2117773	8.90183157	1.4509525	0.07457952

ตารางที่ ข.9 ผลการจัดตารางโดยใช้ Scheduling Algorithm : SLACK/TP

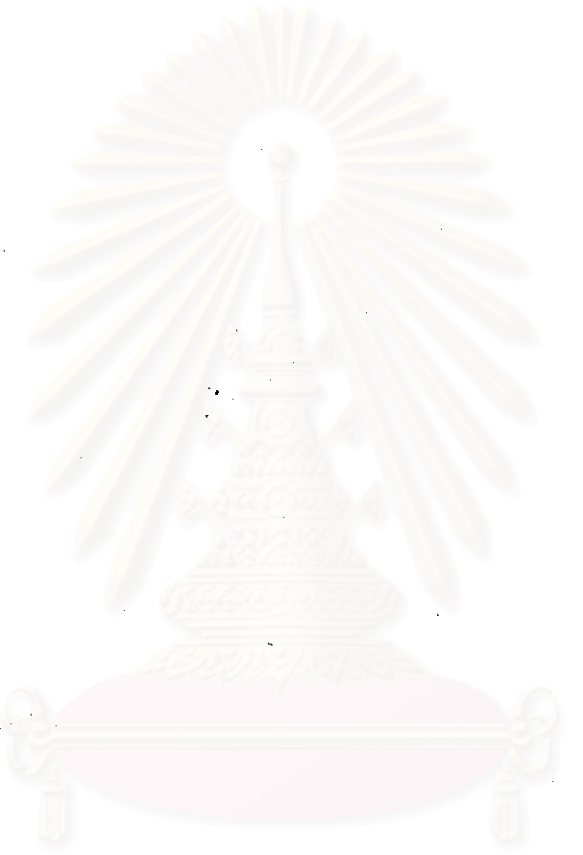
CASE	Option	Scheduling				
		Flowtime	Lateness	Tardiness	Tardy Jobs	Utilization
CASE 1	Active	173.65	14.59	29.5	6	0.58
	Non delay	187.72	28.66	35	7	0.61
CASE 2	Active	134.35	29.03	30.9	9	0.55
	Non delay	113.9	8.58	14.4	8	0.62
CASE 3	Active	192.66	60.4	70.3	9	0.55
	Non delay	188.24	55.99	66	9	0.56
CASE 4	Active	122.84	9.52	16.1	6	0.6
	Non delay	139.57	26.26	30.3	8	0.57
CASE 5	Active	146.4	32.49	33.7	8	0.62
	Non delay	155.73	41.83	42.4	9	0.58
CASE 6	Active	105.3	17.56	21.6	8	0.62
	Non delay	114.09	26.35	27.3	9	0.64
CASE 7	Active	105.14	18.91	21.8	9	0.44
	Non delay	106.12	19.88	25.1	6	0.62
CASE 8	Active	84.87	0.7	4.8	6	0.53
	Non delay	83.65	-0.53	8	6	0.58
CASE 9	Active	130.88	28.12	28.5	9	0.48
	Non delay	127.98	25.21	30.4	8	0.58
CASE 10	Active	148.84	29.07	29.2	9	0.62
	Non delay	153.2	33.42	39.4	7	0.56
	MAX	192.66	60.4	70.3	9	0.64
	MIN	83.65	-0.53	4.8	6	0.44
	AVG	135.7565	25.302	30.235	7.8	0.5755
	STD	32.75016	15.66070	16.10607	1.23969	0.049892

ตารางที่ ข.10 ผลการจัดตารางโดยใช้ Scheduling Algorithm : RANDOM

CASE	Option	Scheduling				
		Flowtime	Lateness	Tardiness	Tardy Jobs	Utilization
CASE 1	Active	164.97	5.91	15.9	5	0.69
	Non delay	181.85	22.79	37.8	6	0.64
CASE 2	Active	99.56	-5.76	9.1	4	0.63
	Non delay	115.01	9.68	27.1	5	0.68
CASE 3	Active	188.09	55.84	68.7	7	0.54
	Non delay	183.04	50.78	70.3	7	0.55
CASE 4	Active	122.51	9.2	26.3	5	0.69
	Non delay	138.77	25.46	31	5	0.61
CASE 5	Active	139.51	25.6	42.6	6	0.61
	Non delay	123.81	9.9	30.1	6	0.67
CASE 6	Active	111.65	23.91	30.1	8	0.57
	Non delay	104.64	16.9	24.4	8	0.72
CASE 7	Active	107.72	21.48	27.3	7	0.55
	Non delay	114.98	28.74	36.1	8	0.61
CASE 8	Active	104.7	20.52	33.4	7	0.65
	Non delay	104.33	20.16	35.2	7	0.67
CASE 9	Active	146.87	44.11	57.9	7	0.57
	Non delay	158.26	55.49	66.4	7	0.52
CASE 10	Active	141.6	21.83	31.3	6	0.58
	Non delay	141.81	22.04	37.9	6	0.58
	MAX	188.09	55.84	70.3	8	0.72
	MIN	99.56	-5.76	9.1	4	0.52
	AVG	134.684	24.229	36.945	6.35	0.6165
	STD	28.49878	16.35551	16.72909	1.136708	0.05815

ภาคผนวก ค

ผลการทดสอบการทำงานของโปรแกรมกับกรณีศึกษาของการจัดตารางแบบโต้ตอบ ประกอบไปด้วยกรณีศึกษา 10 กรณี คือ Case 1 - Case 10 ดังมีรายละเอียดดังตารางที่ ค.1 - ค.10



ตารางที่ ค.1 การจัดตารางแบบโต้ตอบ : EDD

CASE	Option	Interactive Scheduling				
		Flowtime	Lateness	Tardiness	Tardy Jobs	Utilization
CASE 1	Active	142.81	-16.25	10.8	3	0.59
	Non delay	150.53	-8.53	7.6	4	0.69
CASE 2	Active	104.22	-1.1	5.2	3	0.63
	Non delay	97.26	-8.07	3.2	4	0.71
CASE 3	Active	122.25	-10	8.8	4	0.8
	Non delay	126.96	-5.29	3.7	4	0.72
CASE 4	Active	98.18	-15.14	7.1	4	0.79
	Non delay	102.68	-10.63	3.7	3	0.76
CASE 5	Active	110.96	-2.95	13.8	3	0.79
	Non delay	116.91	3	10.2	5	0.83
CASE 6	Active	89.48	1.74	12.8	4	0.68
	Non delay	84.41	-3.33	12.9	4	0.57
CASE 7	Active	89.2	2.97	13.2	4	0.6
	Non delay	88.72	2.49	11.7	4	0.6
CASE 8	Active	79.75	-4.42	2.8	2	0.63
	Non delay	84.92	0.74	11.8	4	0.62
CASE 9	Active	105.81	3.05	7.9	4	0.65
	Non delay	100.27	-2.49	5.3	4	0.65
CASE 10	Active	108.45	-11.32	9.3	3	0.65
	Non delay	104.32	-15.46	3.8	2	0.74
	MAX	150.53	3.05	13.8	5	0.83
	MIN	79.75	-16.25	2.8	2	0.57
	AVG	105.4	-5.0495	8.28	3.6	0.685
	STD	18.952	6.5413	3.7705	0.7539	0.0786

ตารางที่ ค.2 การจัดตารางแบบโต้ตอบ : SPT

CASE	Option	Interactive Scheduling				
		Flowtime	Lateness	Tardiness	Tardy Jobs	Utilization
CASE 1	Active	142.49	-16.56	7.2	2	0.59
	Non delay	148.68	-10.38	4.5	2	0.7
CASE 2	Active	100.39	-4.94	8	3	0.71
	Non delay	100.76	-4.57	5.5	2	0.75
CASE 3	Active	121.97	-10.28	3.4	2	0.76
	Non delay	133.16	0.9	17.2	4	0.79
CASE 4	Active	103.16	-10.15	5.8	4	0.77
	Non delay	103.45	-9.86	9.5	4	0.78
CASE 5	Active	111.8	-2.11	6	5	0.88
	Non delay	110.65	-3.26	6.7	4	0.91
CASE 6	Active	83.28	-4.46	9.9	4	0.62
	Non delay	84.35	-3.4	13	4	0.66
CASE 7	Active	89.72	3.48	9.5	6	0.58
	Non delay	86.66	0.43	9	5	0.58
CASE 8	Active	84.24	0.06	7.6	5	0.58
	Non delay	84.88	0.71	9.8	3	0.63
CASE 9	Active	96.28	-6.49	3.2	3	0.65
	Non delay	103.76	0.99	12.2	4	0.51
CASE 10	Active	105.95	-13.83	3.1	2	0.77
	Non delay	107.91	-11.86	5.3	3	0.73
	MAX	148.68	3.48	17.2	6	0.91
	MIN	83.28	-16.56	3.1	2	0.51
	AVG	105.18	-5.279	7.82	3.55	0.6975
	STD	19.067	5.6708	3.5859	1.191	0.1063

ตารางที่ ค.3 การจัดตารางแบบโต้ตอบ : LPT

CASE	Option	Interactive Scheduling				
		Flowtime	Lateness	Tardiness	Tardy Jobs	Utilization
CASE 1	Active	157.88	-1.17	15.3	5	0.77
	Non delay	159.1	0.05	20.9	5	0.81
CASE 2	Active	98.67	-6.65	9.2	3	0.73
	Non delay	100.39	-4.94	12.2	3	0.79
CASE 3	Active	140.83	8.58	25.5	3	0.85
	Non delay	140.61	8.36	26.9	5	0.83
CASE 4	Active	114.54	1.22	14.7	4	0.73
	Non delay	115.2	1.89	13.6	4	0.74
CASE 5	Active	119.7	5.8	12.7	4	0.77
	Non delay	110.86	-3.05	12.9	4	0.79
CASE 6	Active	86.78	-0.96	16.1	4	0.72
	Non delay	91.22	3.48	15.2	5	0.6
CASE 7	Active	85.95	-0.28	7.8	5	0.58
	Non delay	86.14	-0.1	8.4	5	0.58
CASE 8	Active	90.32	6.14	10.9	4	0.61
	Non delay	87.44	3.26	14.4	5	0.64
CASE 9	Active	123.84	21.07	45	6	0.52
	Non delay	135.8	33.03	18.3	6	0.63
CASE 10	Active	122.26	2.49	13.3	5	0.77
	Non delay	116.12	-3.65	14.8	4	0.74
	MAX	159.1	33.03	45	6	0.85
	MIN	85.95	-6.65	7.8	3	0.52
	AVG	114.18	3.7285	16.405	4.45	0.71
	STD	23.603	9.1748	8.3608	0.887	0.0956

ตารางที่ ค.4 การจัดตารางแบบโต้ตอบ : SDT

CASE	Option	Interactive Scheduling				
		Flowtime	Lateness	Tardiness	Tardy Jobs	Utilization
CASE 1	Active	137.25	-21.8	9.9	2	0.81
	Non delay	141.63	-17.42	10.1	4	0.89
CASE 2	Active	90.61	-14.72	6.1	3	0.78
	Non delay	90.28	-15.04	4.9	2	0.76
CASE 3	Active	130.5	-1.76	20	3	0.82
	Non delay	141.25	9	29.3	3	0.74
CASE 4	Active	99.7	-13.61	2.6	2	0.72
	Non delay	105.22	-8.09	4.4	3	0.76
CASE 5	Active	119.72	29.82	37	5	0.7
	Non delay	115.5	19.22	25.6	4	0.82
CASE 6	Active	83.31	-4.43	13	3	0.56
	Non delay	87.11	-0.63	14.5	4	0.71
CASE 7	Active	85.19	-1.05	4.1	5	0.58
	Non delay	86.8	0.57	8.9	5	0.58
CASE 8	Active	82.74	-1.44	6.4	4	0.58
	Non delay	82.24	-1.94	7.1	4	0.62
CASE 9	Active	115.13	12.37	18.3	6	0.63
	Non delay	115.29	12.52	20.5	6	0.63
CASE 10	Active	109.68	-10.09	2.8	5	0.82
	Non delay	107.89	-11.88	6.6	4	0.81
	MAX	141.63	29.82	37	6	0.89
	MIN	82.24	-21.8	2.6	2	0.56
	AVG	106.35	-2.02	12.605	3.85	0.716
	STD	20.333	13.206	9.64	1.2258	0.1008

ตารางที่ ค.5 การจัดตารางแบบโต้ตอบ : LDT

CASE	Option	Interactive Scheduling				
		Flowtime	Lateness	Tardiness	Tardy Jobs	Utilization
CASE 1	Active	153.05	-6	8.3	4	0.74
	Non delay	150.64	-8.42	12.2	5	0.76
CASE 2	Active	90.14	-15.18	5.3	2	0.77
	Non delay	92.8	-12.52	6.8	3	0.74
CASE 3	Active	132.46	0.21	18	3	0.85
	Non delay	140.35	8.1	26.7	3	0.84
CASE 4	Active	116.56	3.25	18.3	4	0.73
	Non delay	108.43	-4.88	12.8	3	0.74
CASE 5	Active	122.69	8.79	16.8	6	0.8
	Non delay	114.5	0.59	8.7	5	0.83
CASE 6	Active	87.42	-0.32	15.1	3	0.67
	Non delay	88.53	0.78	15.1	4	0.72
CASE 7	Active	87.24	1.01	6.4	3	0.58
	Non delay	84.89	-1.34	5.1	5	0.57
CASE 8	Active	93.62	9.44	22.9	4	0.62
	Non delay	85.16	0.98	8	4	0.69
CASE 9	Active	123.31	20.54	27.8	5	0.62
	Non delay	125.2	22.43	29.5	6	0.58
CASE 10	Active	109.3	-10.47	6.6	4	0.81
	Non delay	114.65	-5.12	12.9	4	0.63
	MAX	153.05	22.43	29.5	6	0.85
	MIN	84.89	-15.18	5.1	2	0.57
	AVG	111.05	0.5935	14.165	4	0.7145
	STD	22.077	9.7848	7.7362	1.0761	0.0906

ตารางที่ ค.6 การจัดตารางแบบโต้ตอบ : SMT

CASE	Option	Interactive Scheduling				
		Flowtime	Lateness	Tardiness	Tardy Jobs	Utilization
CASE 1	Active	144.89	-14.17	13	4	0.55
	Non delay	140.88	-18.18	8	5	0.63
CASE 2	Active	94.74	-10.59	2.9	4	0.68
	Non delay	94.76	-10.57	2.3	4	0.79
CASE 3	Active	127.33	-4.29	11.9	4	0.76
	Non delay	119.49	-12.76	5.8	4	0.74
CASE 4	Active	109.62	-3.7	16.2	3	0.73
	Non delay	105.73	-7.59	8.1	4	0.78
CASE 5	Active	113.93	0.03	11.4	4	0.82
	Non delay	107.21	-6.69	4.1	3	0.83
CASE 6	Active	75.31	-12.43	8.2	2	0.65
	Non delay	83.26	-4.48	10.8	4	0.6
CASE 7	Active	86.2	-0.04	6.3	5	0.58
	Non delay	88.77	2.53	8.9	5	0.58
CASE 8	Active	78.08	-6.09	4.2	3	0.59
	Non delay	80.43	-3.75	7.1	3	0.68
CASE 9	Active	104.7	1.93	6.3	4	0.62
	Non delay	101.91	-0.86	9.4	4	0.56
CASE 10	Active	110.45	-9.32	15	3	0.65
	Non delay	108.03	-11.74	9.4	3	0.74
	MAX	144.89	2.53	16.2	5	0.83
	MIN	75.31	-18.18	2.3	2	0.55
	AVG	103.79	-6.638	8.465	3.75	0.678
	STD	19.497	5.7696	3.8105	0.7864	0.09

ตารางที่ ค.7 การจัดตารางแบบโต้ตอบ : LMT

CASE	Option	Interactive Scheduling				
		Flowtime	Lateness	Tardiness	Tardy Jobs	Utilization
CASE 1	Active	149.74	-9.31	13.7	5	0.78
	Non delay	156.73	-2.32	24	5	0.84
CASE 2	Active	95.17	-10.16	7.6	3	0.78
	Non delay	94.1	-11.22	6.1	3	0.77
CASE 3	Active	141.17	8.92	23.1	4	0.83
	Non delay	139.32	7.07	24.6	4	0.74
CASE 4	Active	111.58	-1.74	13.9	4	0.75
	Non delay	114.95	1.64	17.2	4	0.76
CASE 5	Active	120.25	6.34	18.5	6	0.79
	Non delay	119.61	5.7	17.6	3	0.75
CASE 6	Active	89.73	1.99	13.8	4	0.72
	Non delay	89.62	1.88	14.3	5	0.72
CASE 7	Active	89.93	3.7	11.8	4	0.58
	Non delay	87.84	1.6	8.6	5	0.58
CASE 8	Active	88.02	3.85	16.3	4	0.64
	Non delay	83.81	-0.37	8.6	4	0.64
CASE 9	Active	119.8	17.03	26	6	0.61
	Non delay	124.02	21.25	27.3	6	0.66
CASE 10	Active	116.23	-3.54	10.6	4	0.7
	Non delay	122.39	2.61	16.1	4	0.72
	MAX	156.73	21.25	27.3	6	0.84
	MIN	83.81	-11.22	6.1	3	0.58
	AVG	112.7	2.246	15.985	4.35	0.718
	STD	22.384	8.0389	6.3608	0.9333	0.0771

ตารางที่ ค.8 การจัดตารางแบบโต้ตอบ : SLACK

CASE	Option	Interactive Scheduling				
		Flowtime	Lateness	Tardiness	Tardy Jobs	Utilization
CASE 1	Active	142.78	-16.28	11.3	2	0.53
	Non delay	149.6	-9.46	7.7	3	0.69
CASE 2	Active	94.65	-10.68	7.9	2	0.77
	Non delay	87.87	-17.45	2.8	2	0.77
CASE 3	Active	124.74	-7.51	4.9	4	0.75
	Non delay	131.96	-0.3	12.1	5	0.75
CASE 4	Active	103.03	-10.29	7.3	4	0.78
	Non delay	102.66	-10.65	4.1	4	0.69
CASE 5	Active	114.71	0.8	17.4	4	0.75
	Non delay	116.24	2.33	14.2	5	0.79
CASE 6	Active	85.72	-2.02	112.9	4	0.69
	Non delay	88.86	1.12	11.5	4	0.68
CASE 7	Active	85.86	-0.38	9.5	4	0.57
	Non delay	86.3	0.07	6.3	5	0.58
CASE 8	Active	80.23	-3.94	2.8	2	0.63
	Non delay	79.94	-4.24	3.1	4	0.68
CASE 9	Active	104.47	1.71	9.3	6	0.59
	Non delay	109.31	6.55	12.1	6	0.66
CASE 10	Active	103.07	-16.7	6.7	4	0.68
	Non delay	104.7	-15.08	8.3	4	0.76
	MAX	149.6	6.55	112.9	6	0.79
	MIN	79.94	-17.45	2.8	2	0.53
	AVG	104.84	-5.62	13.61	3.9	0.6895
	STD	20.23	7.3067	23.698	1.2096	0.0773

ตารางที่ ค.9 การจัดตารางแบบโต้ตอบ : SLACK/TP

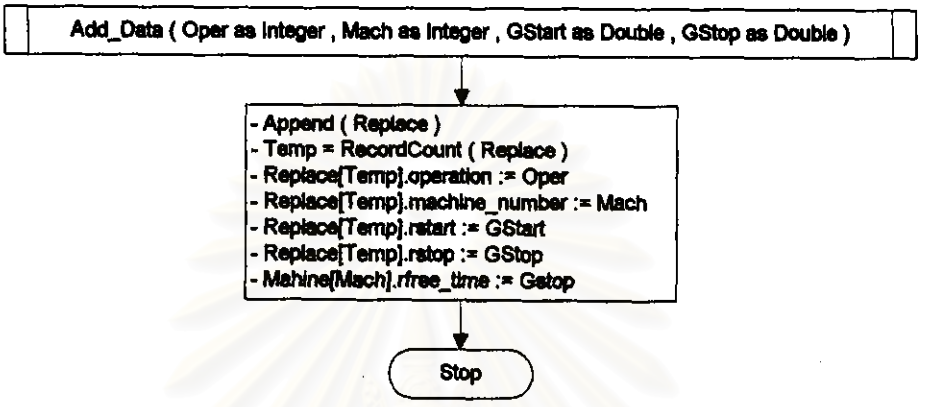
CASE	Option	Interactive Scheduling				
		Flowtime	Lateness	Tardiness	Tardy Jobs	Utilization
CASE 1	Active	152.48	-6.57	10.4	4	0.77
	Non delay	153.47	-5.58	15.6	5	0.73
CASE 2	Active	97.66	-7.67	6.7	2	0.7
	Non delay	92.72	-12.61	7.5	4	0.77
CASE 3	Active	145	12.75	23.9	5	0.85
	Non delay	137.89	5.63	18.2	3	0.83
CASE 4	Active	110.47	-2.84	9.7	4	0.77
	Non delay	102.62	-10.69	9.7	3	0.79
CASE 5	Active	124	10.1	27.3	5	0.73
	Non delay	114.38	0.48	8	5	0.9
CASE 6	Active	88.54	0.8	11.7	4	0.66
	Non delay	85.97	-1.77	14.4	4	0.68
CASE 7	Active	88.63	2.4	7.9	5	0.58
	Non delay	87.15	0.92	11.4	4	0.6
CASE 8	Active	79.63	-4.54	3.1	4	0.59
	Non delay	76.65	-7.52	1.7	3	0.66
CASE 9	Active	115.44	12.67	17.9	7	0.57
	Non delay	114.99	12.23	21.1	7	0.62
CASE 10	Active	107.5	-12.27	12.7	3	0.66
	Non delay	120.45	0.68	16.3	4	0.69
	MAX	153.47	12.75	27.3	7	0.9
	MIN	76.65	-12.61	1.7	2	0.57
	AVG	109.78	-0.67	12.76	4.25	0.7075
	STD	23.662	8.1132	6.641	1.2513	0.094

ตารางที่ ค.10 การจัดตารางแบบโต้ตอบ : RANDOM

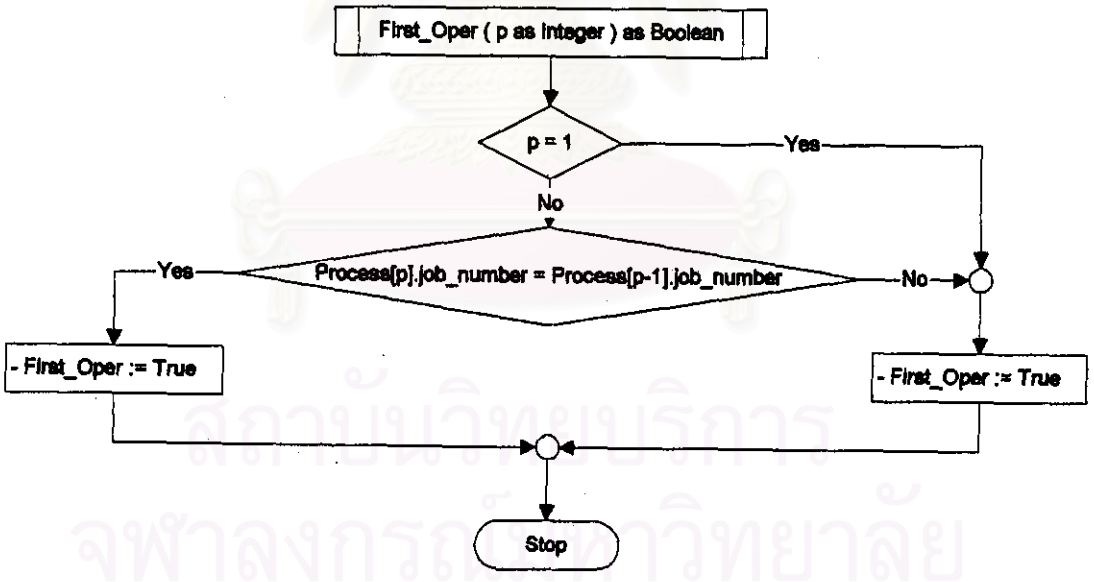
CASE	Option	Interactive Scheduling				
		Flowtime	Lateness	Tardiness	Tardy Jobs	Utilization
CASE 1	Active	152.06	-6.99	8.8	3	0.79
	Non delay	141.61	-17.44	7.2	4	0.81
CASE 2	Active	90.57	-14.76	2.4	2	0.78
	Non delay	92.47	-12.86	3.3	2	0.78
CASE 3	Active	141.64	9.38	24.2	4	0.79
	Non delay	143.5	11.25	29.8	5	0.86
CASE 4	Active	99.93	-13.38	4.3	3	0.8
	Non delay	106.97	-6.34	4.3	3	0.77
CASE 5	Active	109.89	-4.01	13.2	5	0.86
	Non delay	115.22	1.31	18.4	5	0.87
CASE 6	Active	95.43	7.69	16.2	5	0.72
	Non delay	94.07	6.32	14.9	6	0.76
CASE 7	Active	88.12	1.88	9.6	5	0.58
	Non delay	88.41	2.17	8.5	5	0.58
CASE 8	Active	90.98	6.81	14.7	5	0.68
	Non delay	92.11	7.94	18.8	4	0.69
CASE 9	Active	116.06	13.29	17.8	6	0.66
	Non delay	115.49	12.72	22.3	7	0.6
CASE 10	Active	115.42	-4.35	11.8	4	0.74
	Non delay	128.19	8.42	18.2	5	0.8
	MAX	152.06	13.29	29.8	7	0.87
	MIN	88.12	-17.44	2.4	2	0.58
	AVG	110.91	0.4525	13.435	4.4	0.746
	STD	20.797	9.8106	7.4777	1.3139	0.0889

ภาคผนวก ง

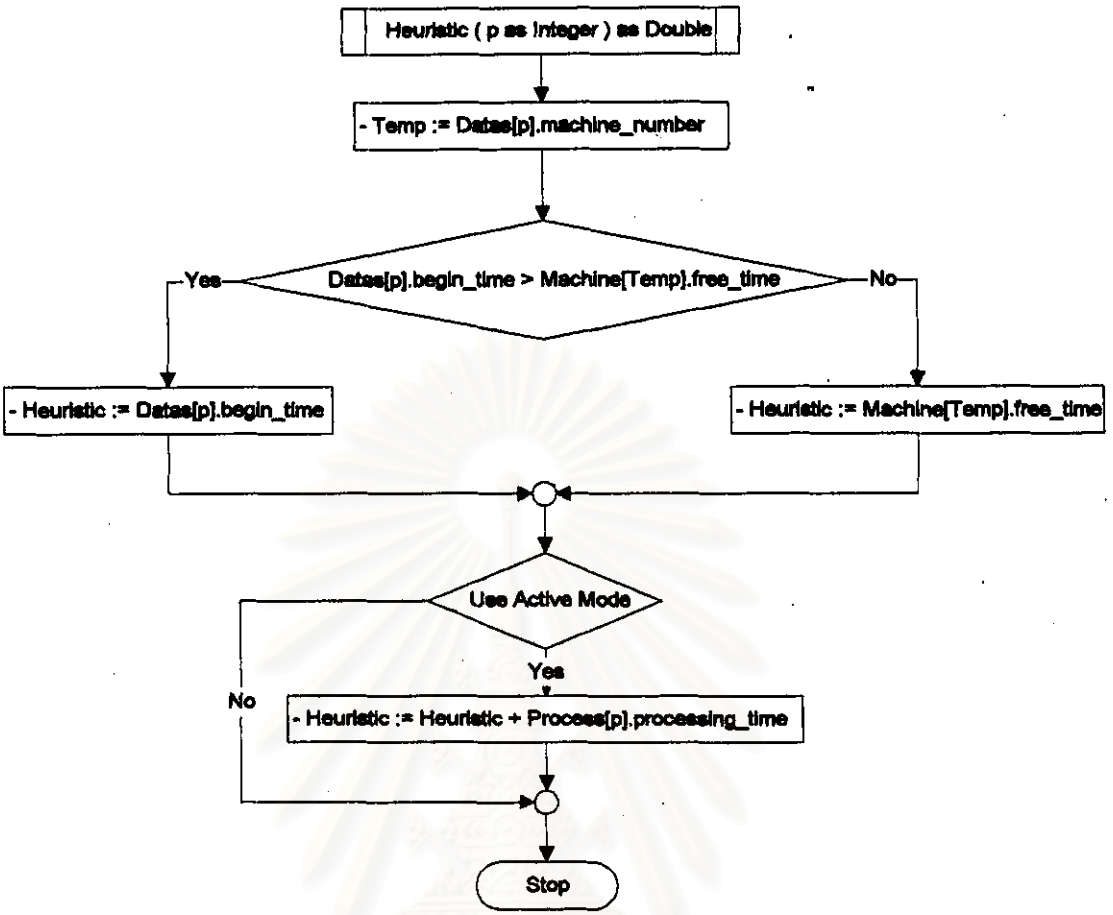
ในภาคผนวก ง นี้จะกล่าวถึงรายละเอียดของโปรแกรมการจัดตาราง / การเปลี่ยนตารางการผลิต ซึ่งสามารถแสดงได้เป็น Flow Chart และโปรแกรมดังต่อไปนี้



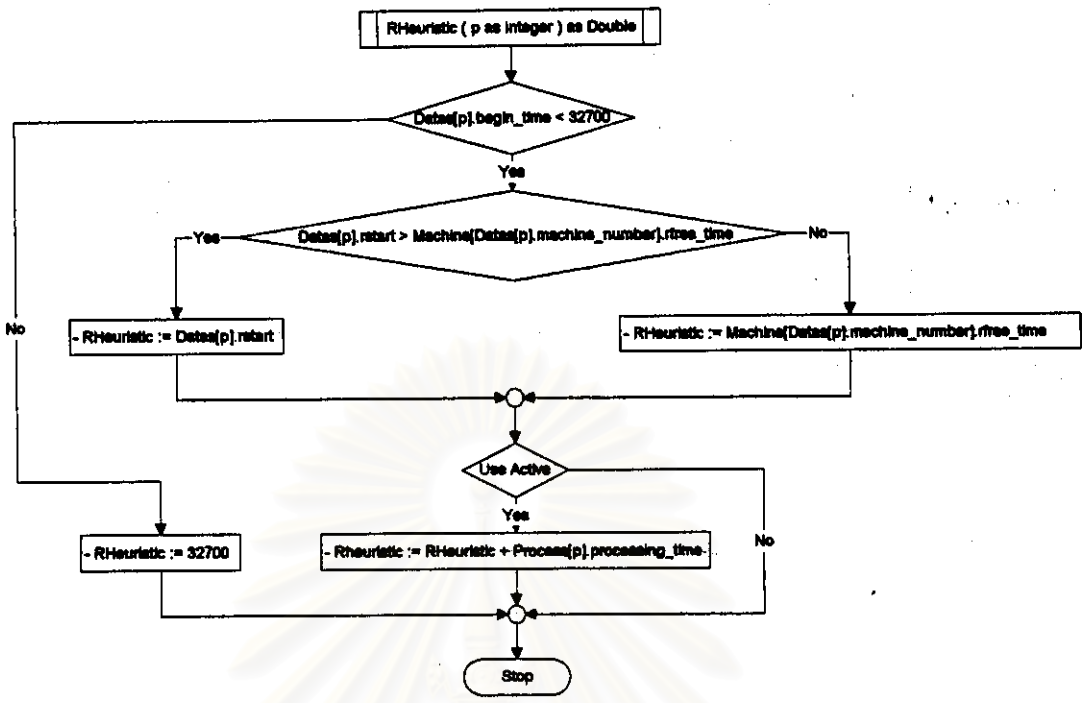
รูปที่ ง.1 Flow Chart สำหรับการรับข้อมูล



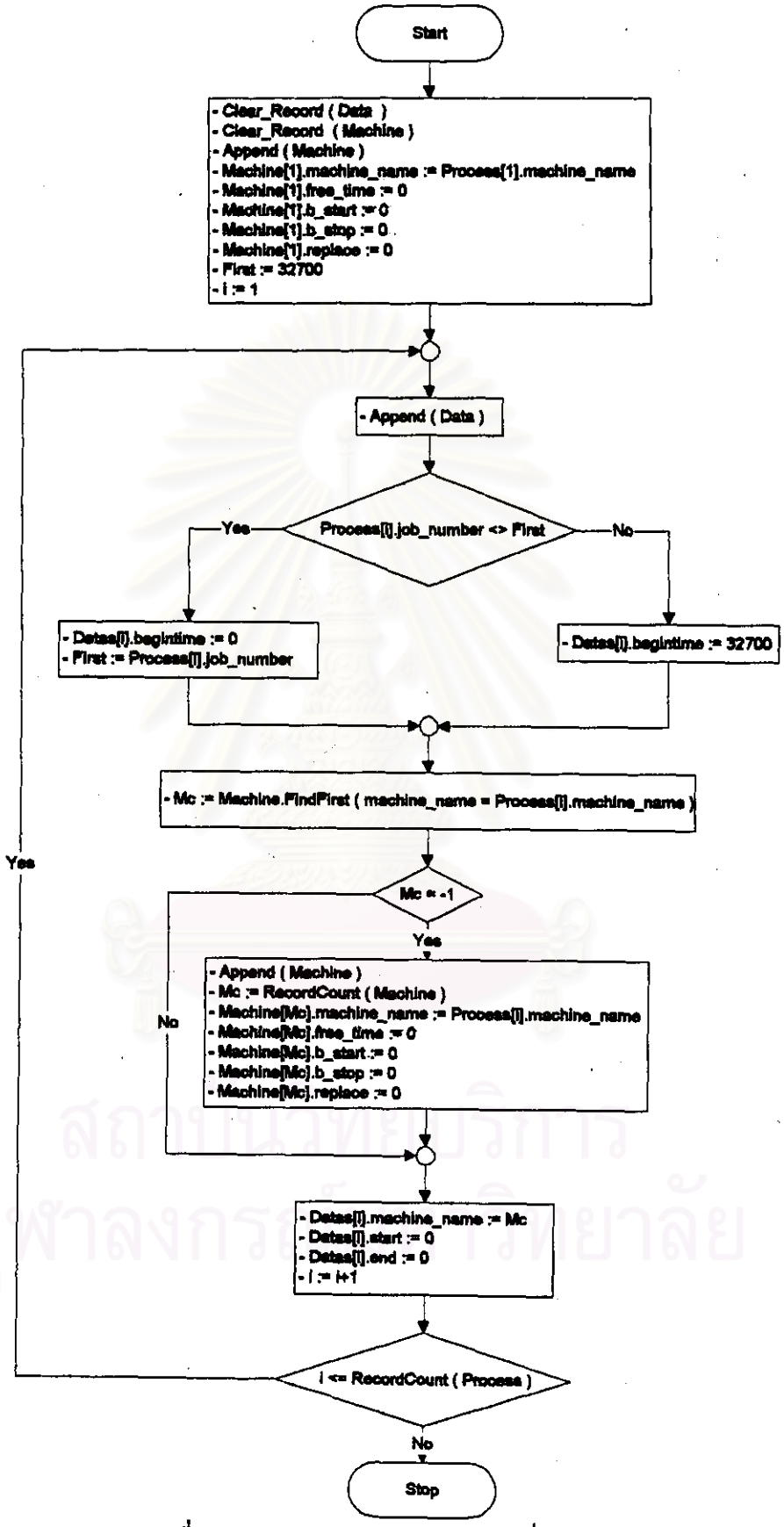
รูปที่ ง.2 Flow Chart แสดงการรับข้อมูลของงานแรก



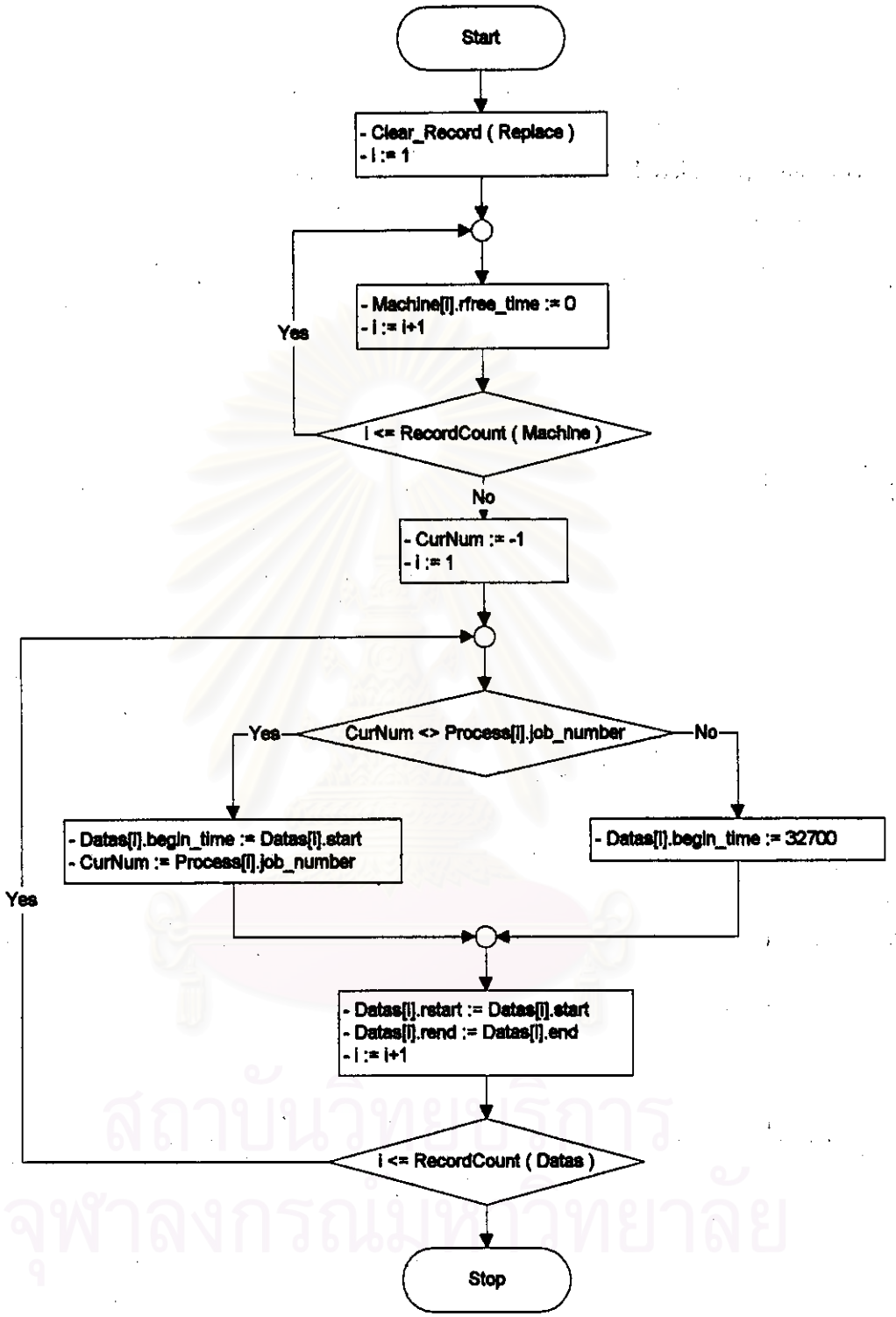
รูปที่ 4.3 Flow Chart แสดงการเลือก Active / Non delay



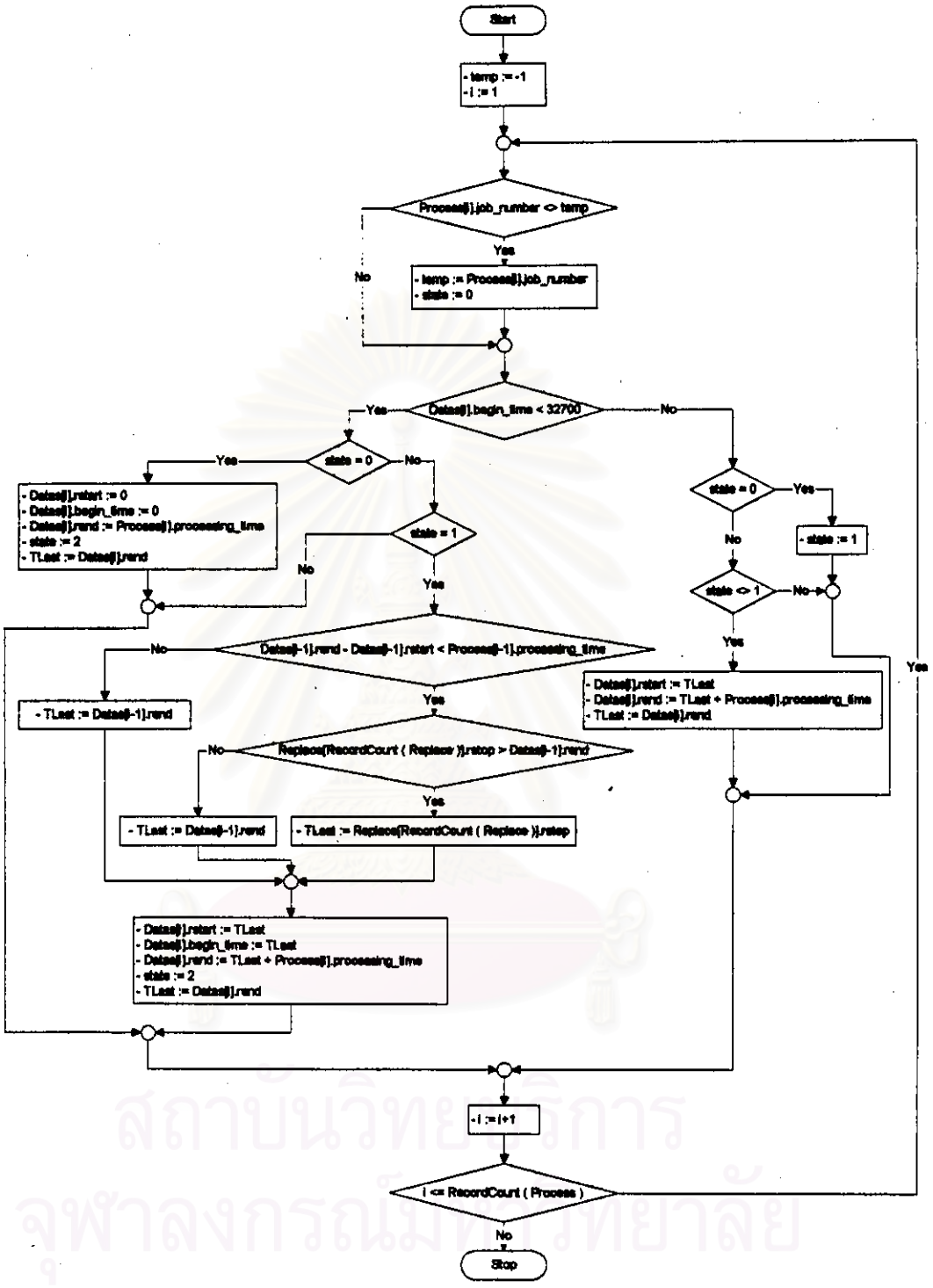
รูปที่ 4.4 Flow Chart แสดงการเลือก Active / Non delay



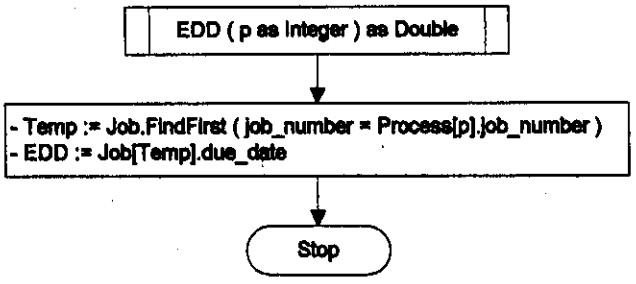
รูปที่ ง.5 Flow Chart แสดงการหาเครื่องจักร



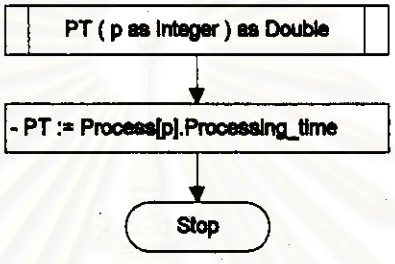
รูปที่ ง.6 Flow Chart แสดงการหาเครื่องจักร



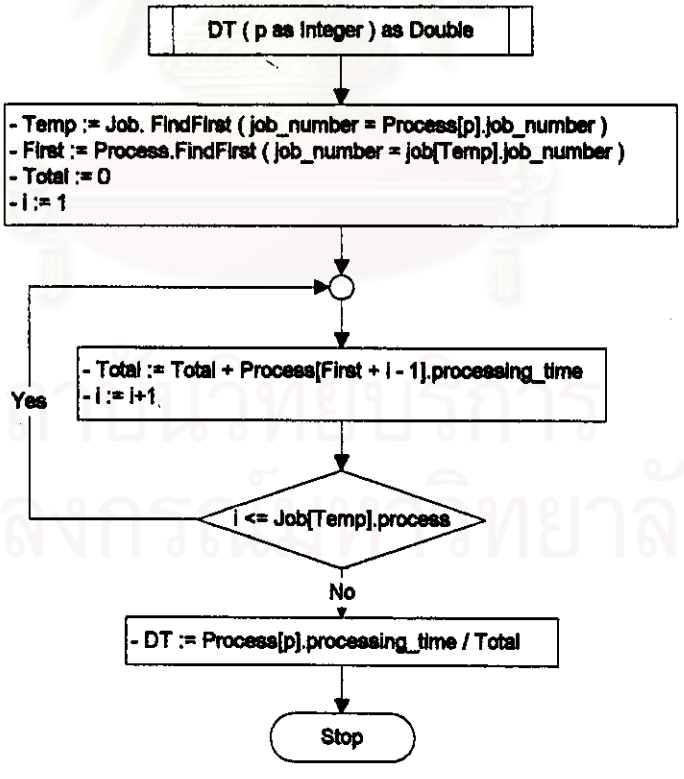
รูปที่ ง.7 Flow Chart แสดงเปลี่ยนเครื่องจักร



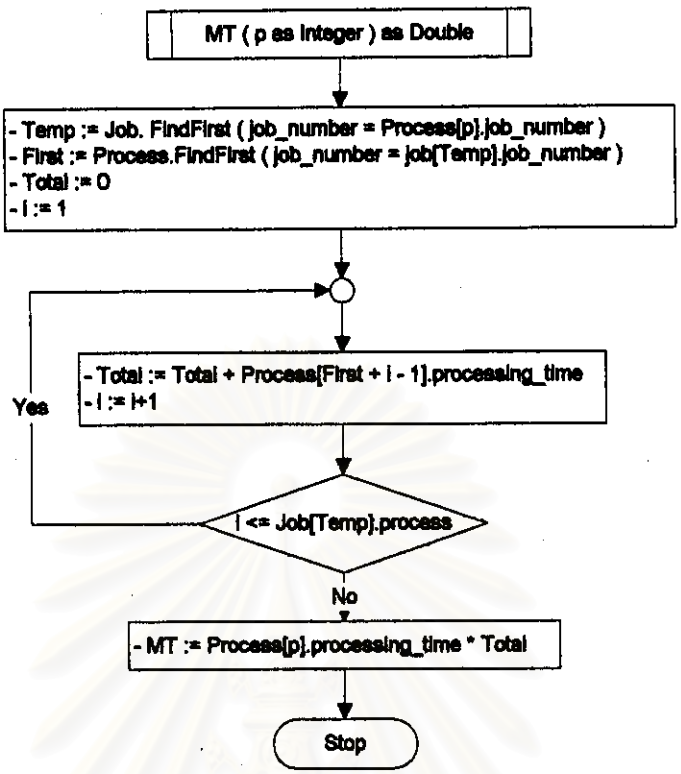
รูปที่ ง.8 Flow Chart แสดงกฎเกณฑ์ EDD



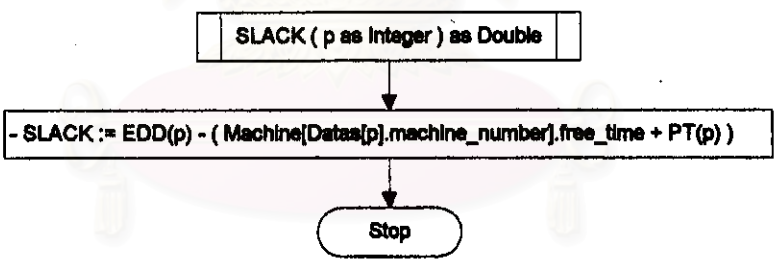
รูปที่ ง.9 Flow Chart แสดงกฎเกณฑ์ SPT/LPT



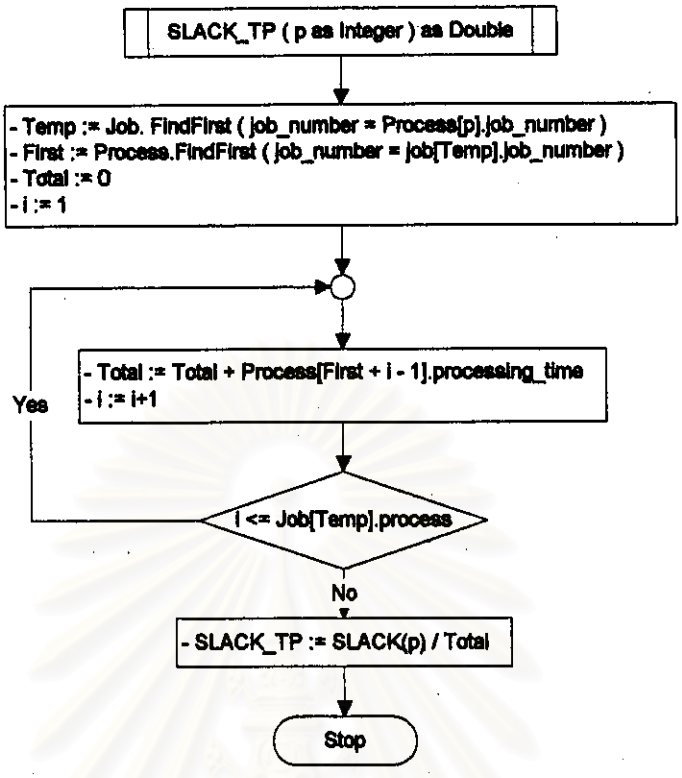
รูปที่ ง.10 Flow Chart แสดงกฎเกณฑ์ SDT/LDT



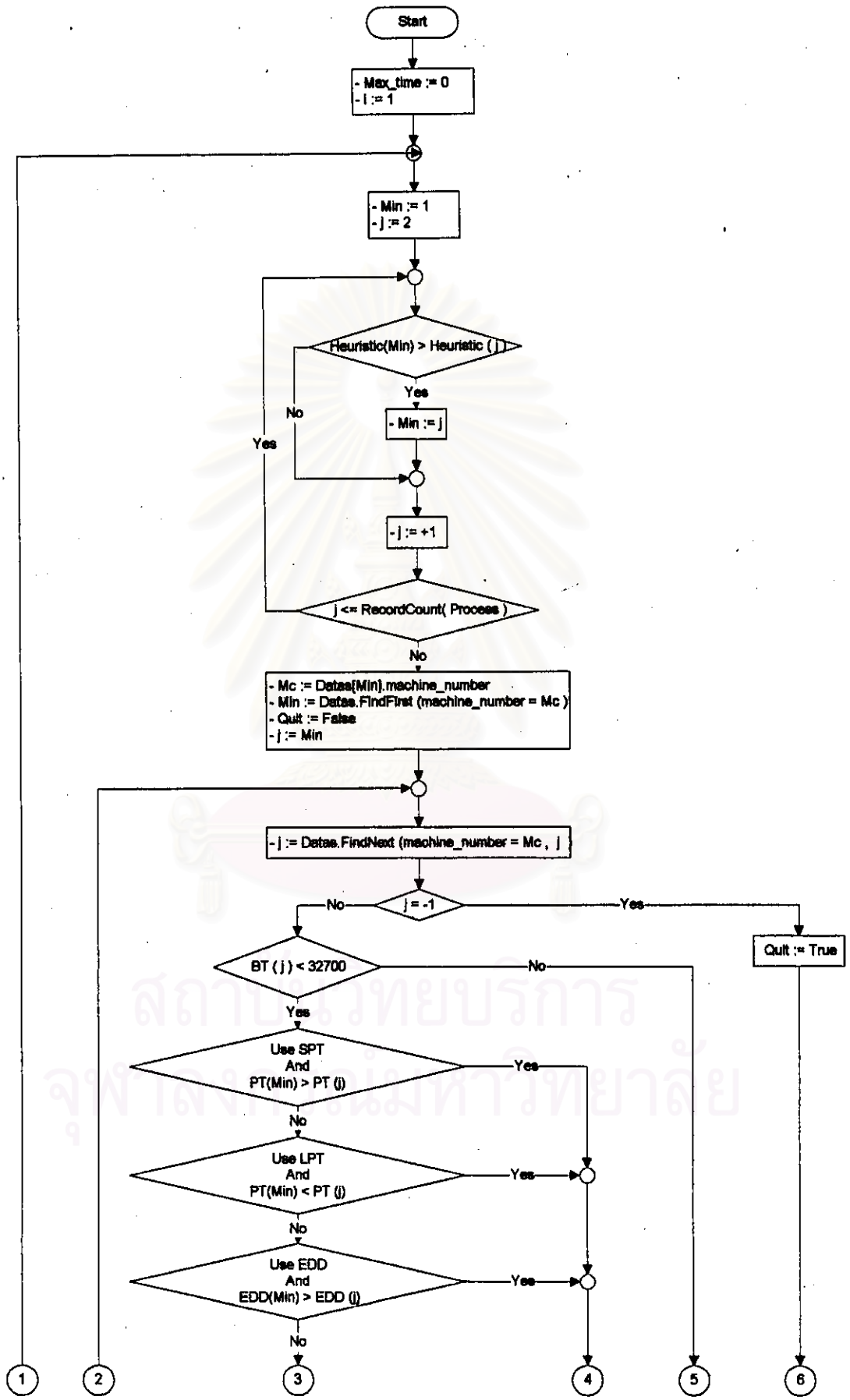
รูปที่ ง.11 Flow Chart แสดงกฎเกณฑ์ SMT/LMT

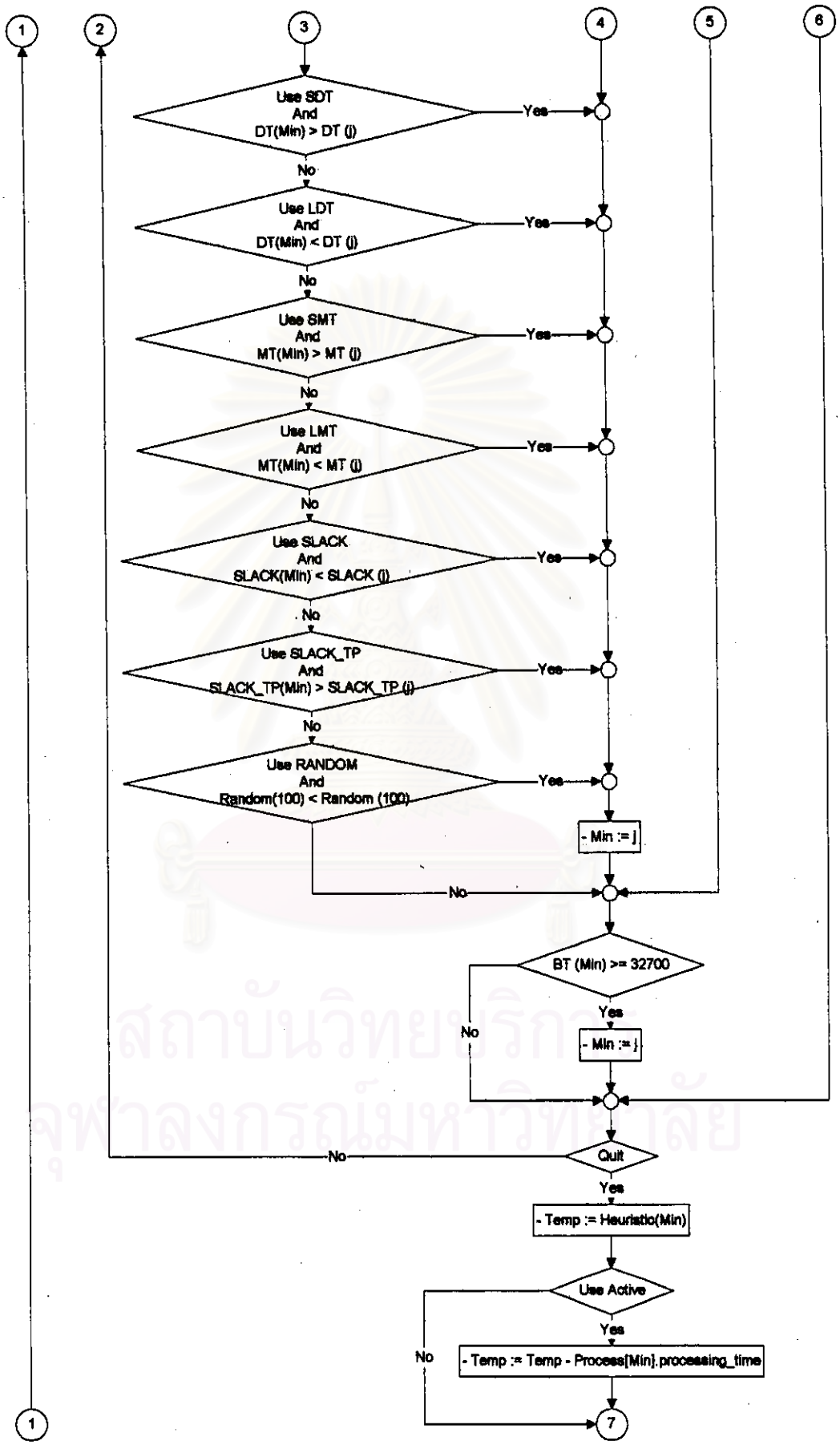


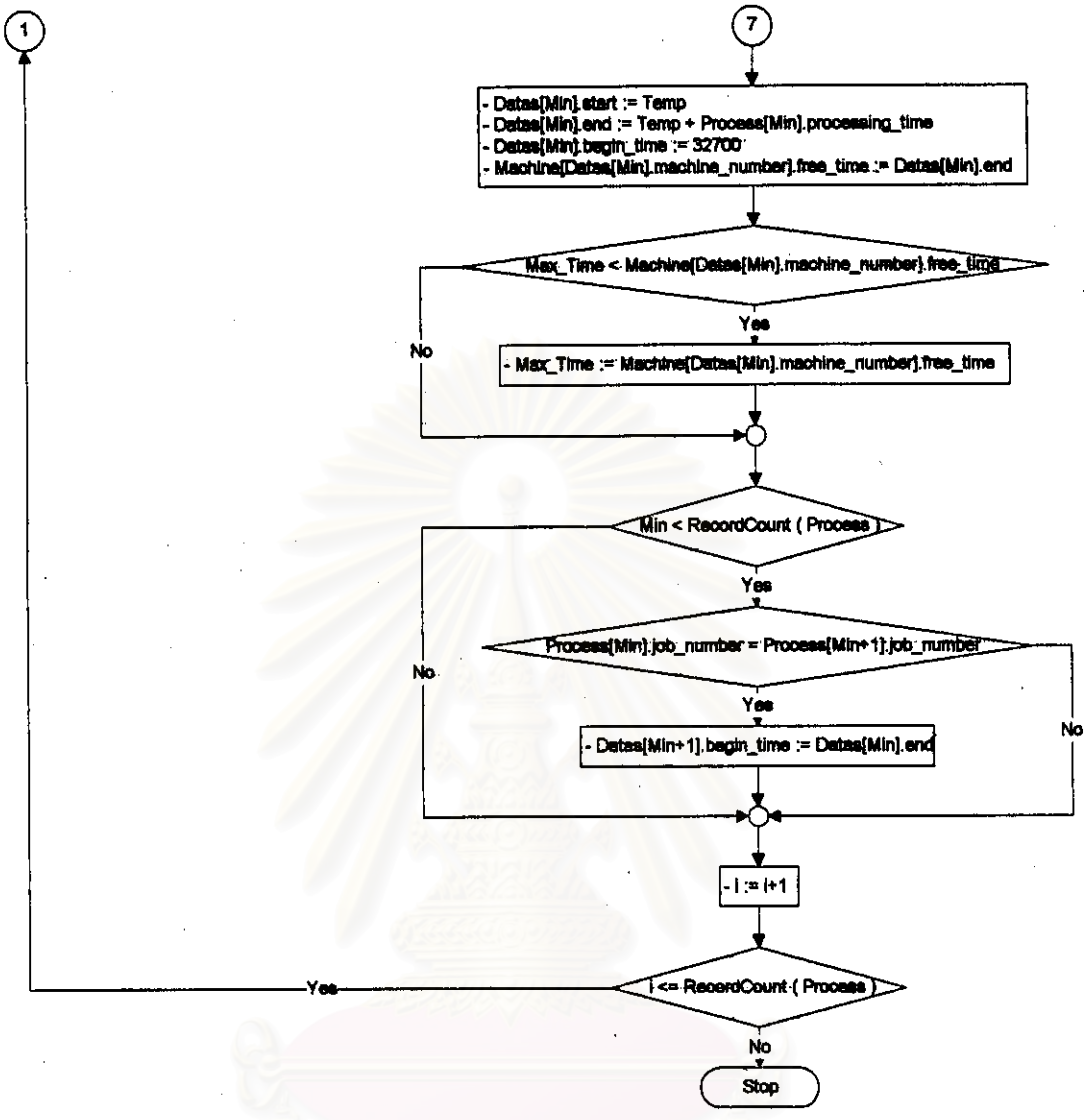
รูปที่ ง.12 Flow Chart แสดงกฎเกณฑ์ SLACK



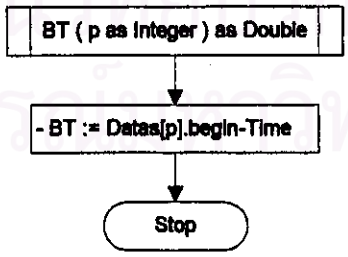
รูปที่ ง.13 Flow Chart แสดงกฎเกณฑ์ SLACK/TP


Start
- Max_time := 0
- i := 1
- Min := 1
- j := 2
Heuristic(Min) > Heuristic (j)
Yes
No
- Min := j
Yes
- j := +1
j <= RecordCount(Process)
No
- Mc := Datas[Min].machine_number
- Min := Datas.FindFirst (machine_number = Mc)
- Quit := False
- j := Min
- j := Datas.FindNext (machine_number = Mc , j)
j = -1
No
Yes
Quit := True
BT (j) < 32700
No
Yes
Use SPT
And
PT(Min) > PT (j)
Yes
No
Use LPT
And
PT(Min) < PT (j)
Yes
No
Use EDD
And
EDD(Min) > EDD (j)
Yes
No
1
2
3
4
5
6

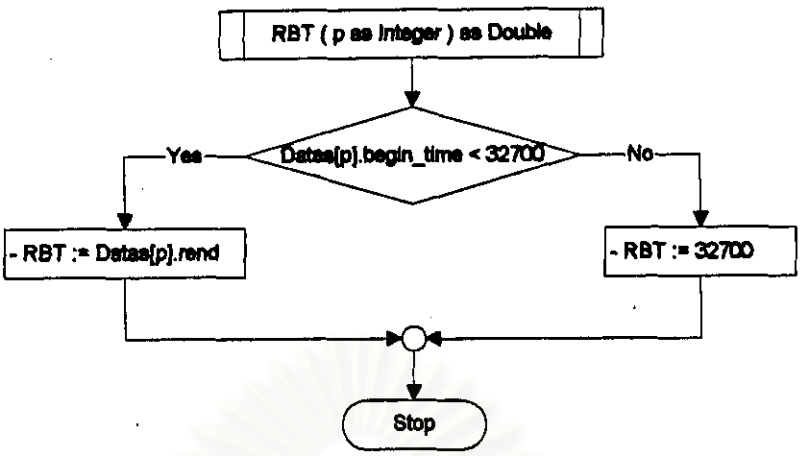

1
2
3
4
5
6
Use SDT And DT(Min) > DT (j)
Yes
No
Use LDT And DT(Min) < DT (j)
Yes
No
Use SMT And MT(Min) > MT (j)
Yes
No
Use LMT And MT(Min) < MT (j)
Yes
No
Use SLACK And SLACK(Min) < SLACK (j)
Yes
No
Use SLACK_TP And SLACK_TP(Min) > SLACK_TP (j)
Yes
No
Use RANDOM And Random(100) < Random (100)
Yes
- Min := j
No
BT (Min) >= 32700
Yes
No
- Min := j
Quit
No
Yes
- Temp := Heuristic(Min)
Use Active
Yes
No
- Temp := Temp - Process[Min].processing_time
7
1



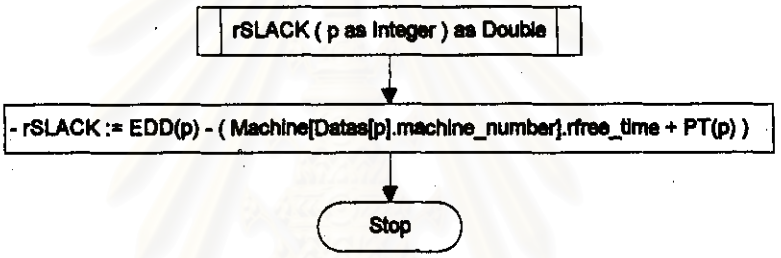
รูปที่ 3.14 Flow Chart แสดงการสร้าง Gantt Chart



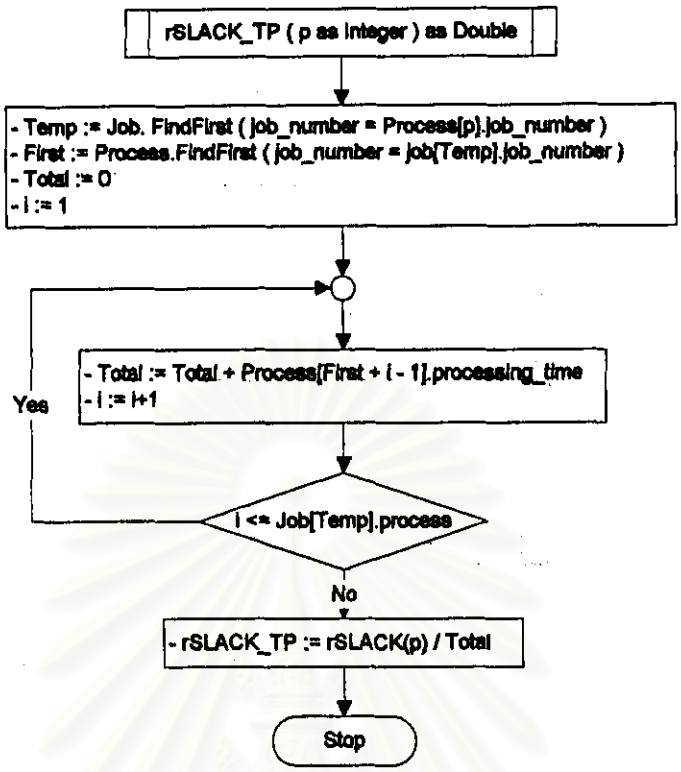
รูปที่ 3.15 Flow Chart แสดง Breakdown Time



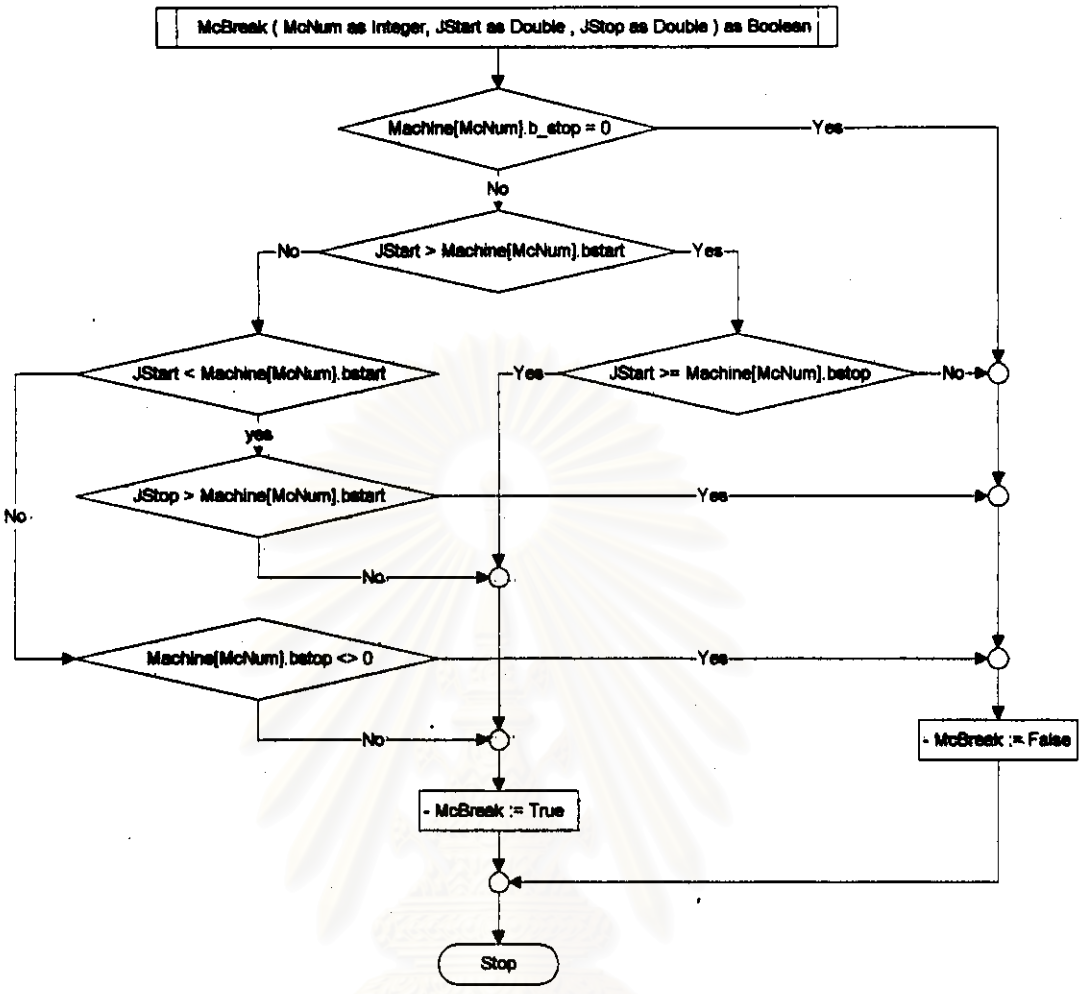
รูปที่ 4.16 Flow Chart แสดงการสร้าง Breakdown Time อีกครั้ง



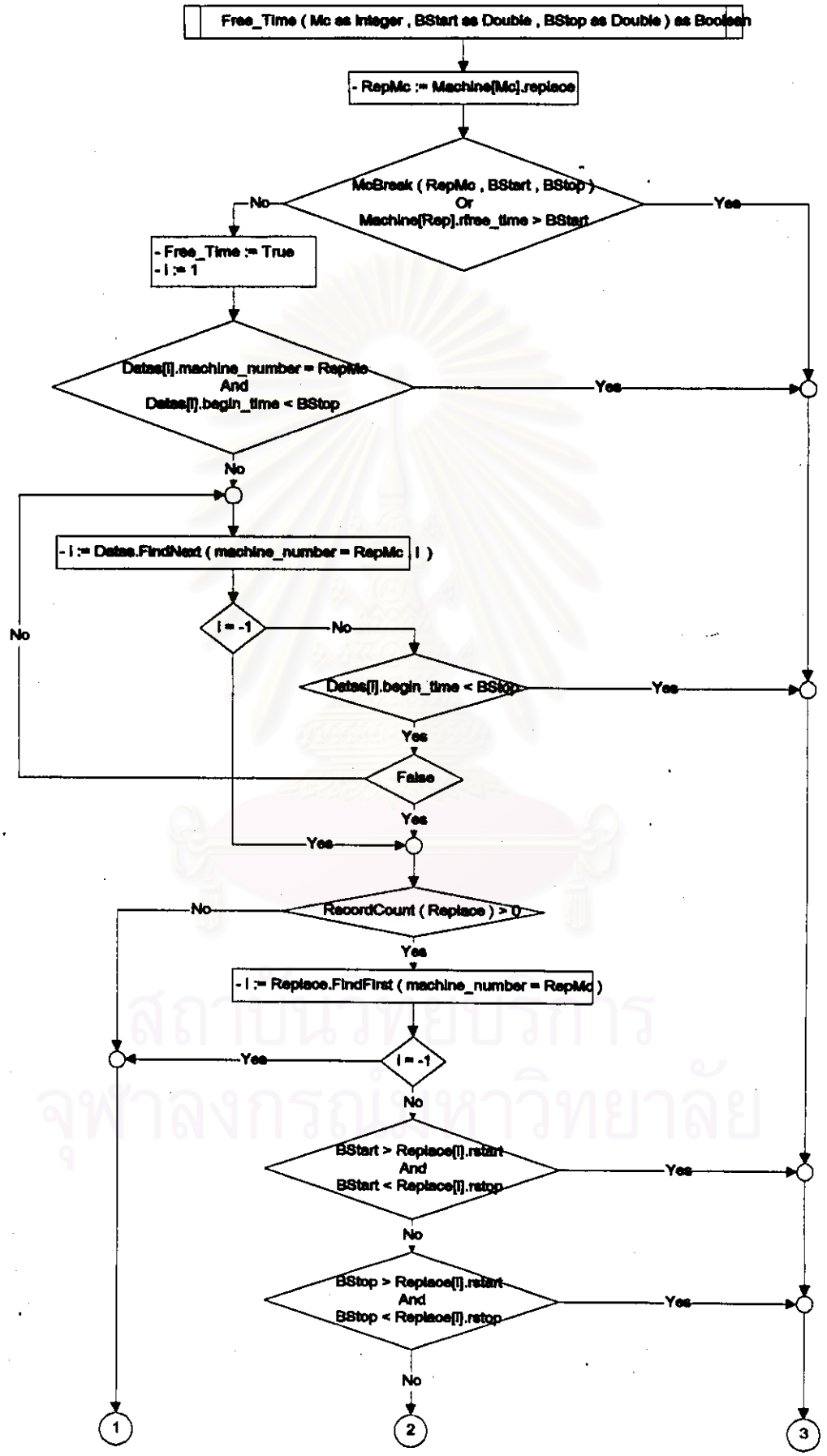
รูปที่ 4.17 Flow Chart แสดงกฎเกณฑ์ Rescheduling : SLACK

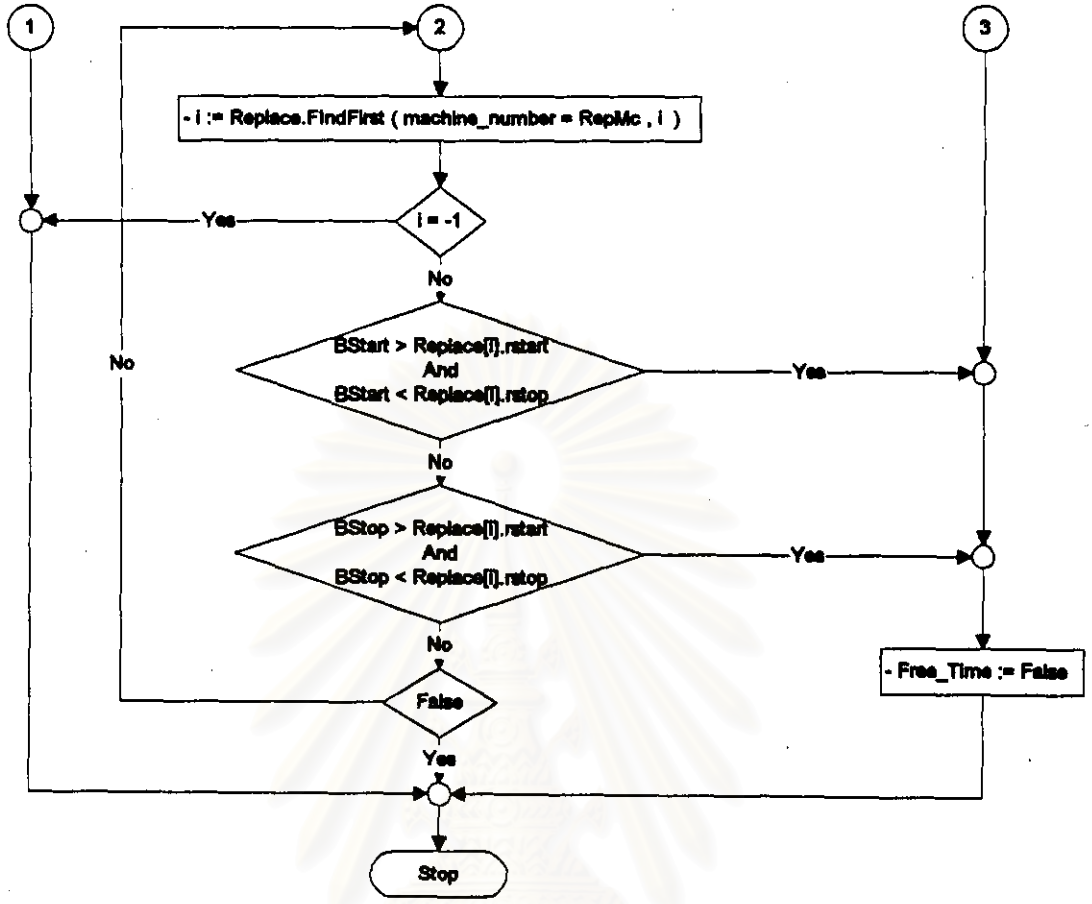


รูปที่ 4.18 Flow Chart แสดงกฎเกณฑ์ Rescheduling : SLACK/TP

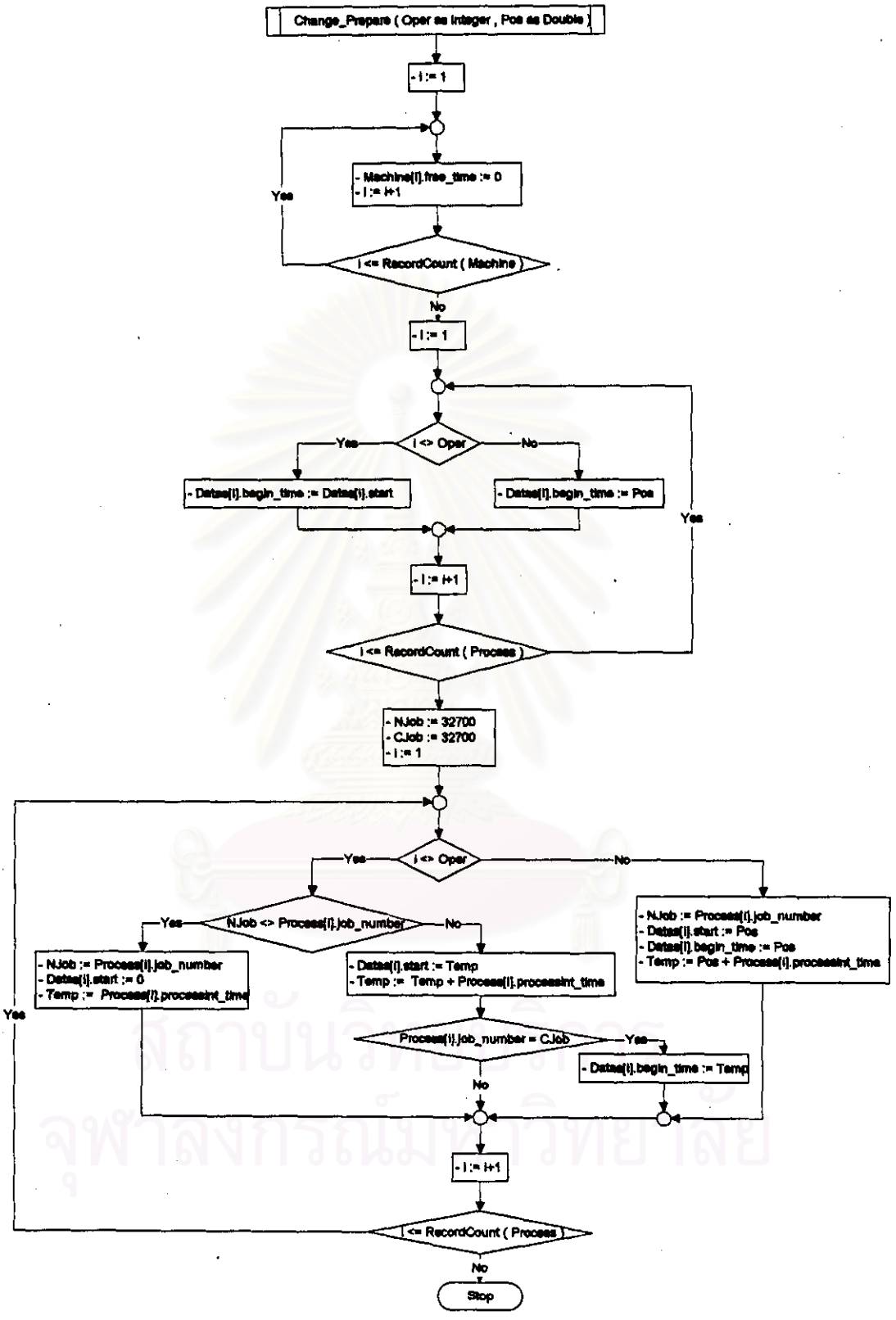


รูปที่ 3.19 Flow Chart แสดงเครื่องจักรเสีย

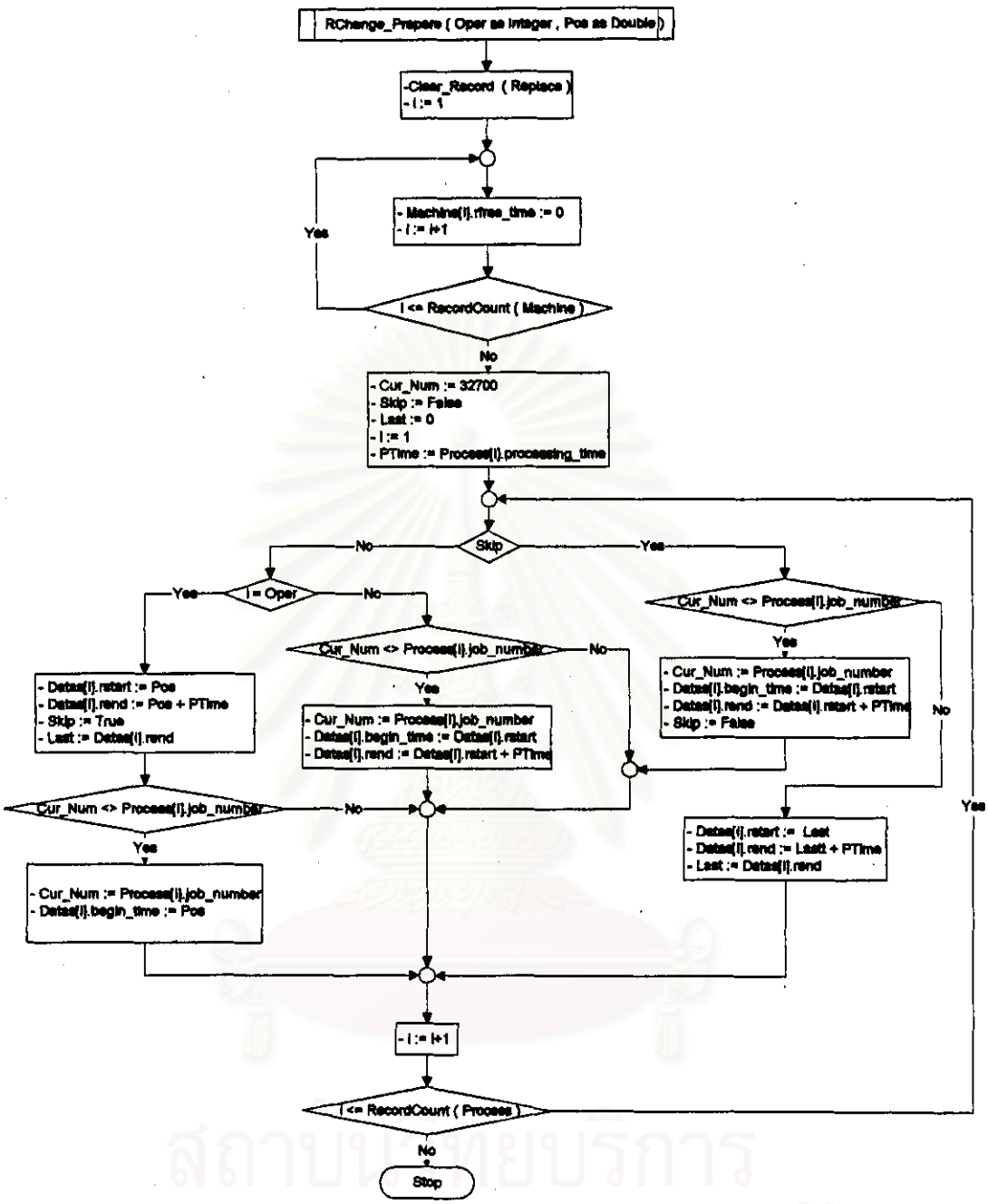

Free_Time (Mc as Integer , BStart as Double , BStop as Double) as Boolean
- RepMc := Machine[Mc].replace
McBreak (RepMc , BStart , BStop)
Or
Machine[Rep].rfree_time > BStart
No
Yes
- Free_Time := True
- I := 1
Datas[I].machine_number = RepMc
And
Datas[I].begin_time < BStop
Yes
No
- I := Datas.FindNext (machine_number = RepMc , I)
I = -1
No
No
Datas[I].begin_time < BStop
Yes
Yes
False
Yes
Yes
No
RecordCount (Replace) > 0
Yes
- I := Replace.FindFirst (machine_number = RepMc)
Yes
I = -1
No
BStart > Replace[I].rstart
And
BStart < Replace[I].rstop
Yes
No
BStop > Replace[I].rstart
And
BStop < Replace[I].rstop
Yes
No
1
2
3



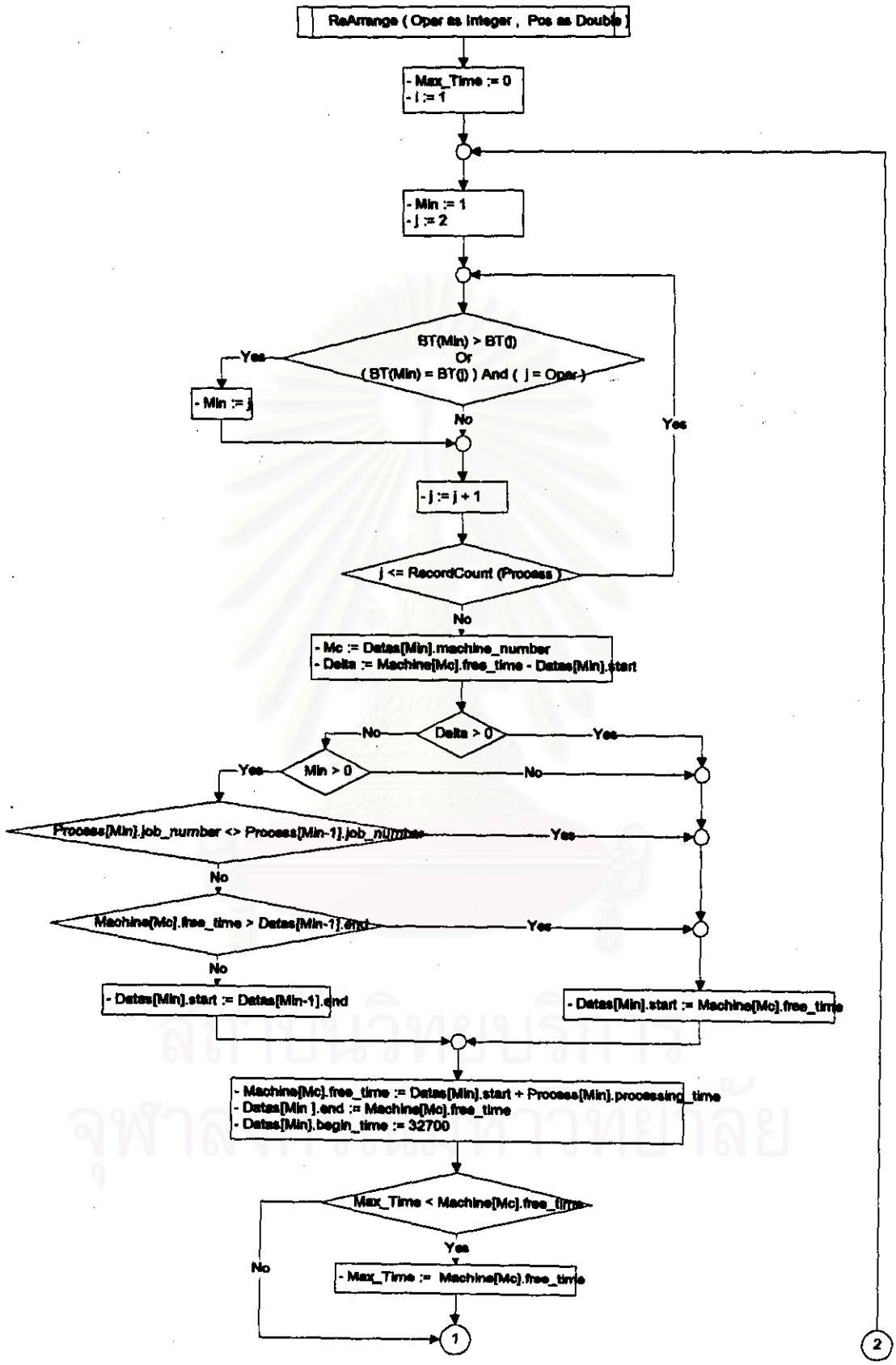
รูปที่ 4.20 Flow Chart แสดงเวลาว่างของเครื่องจักร

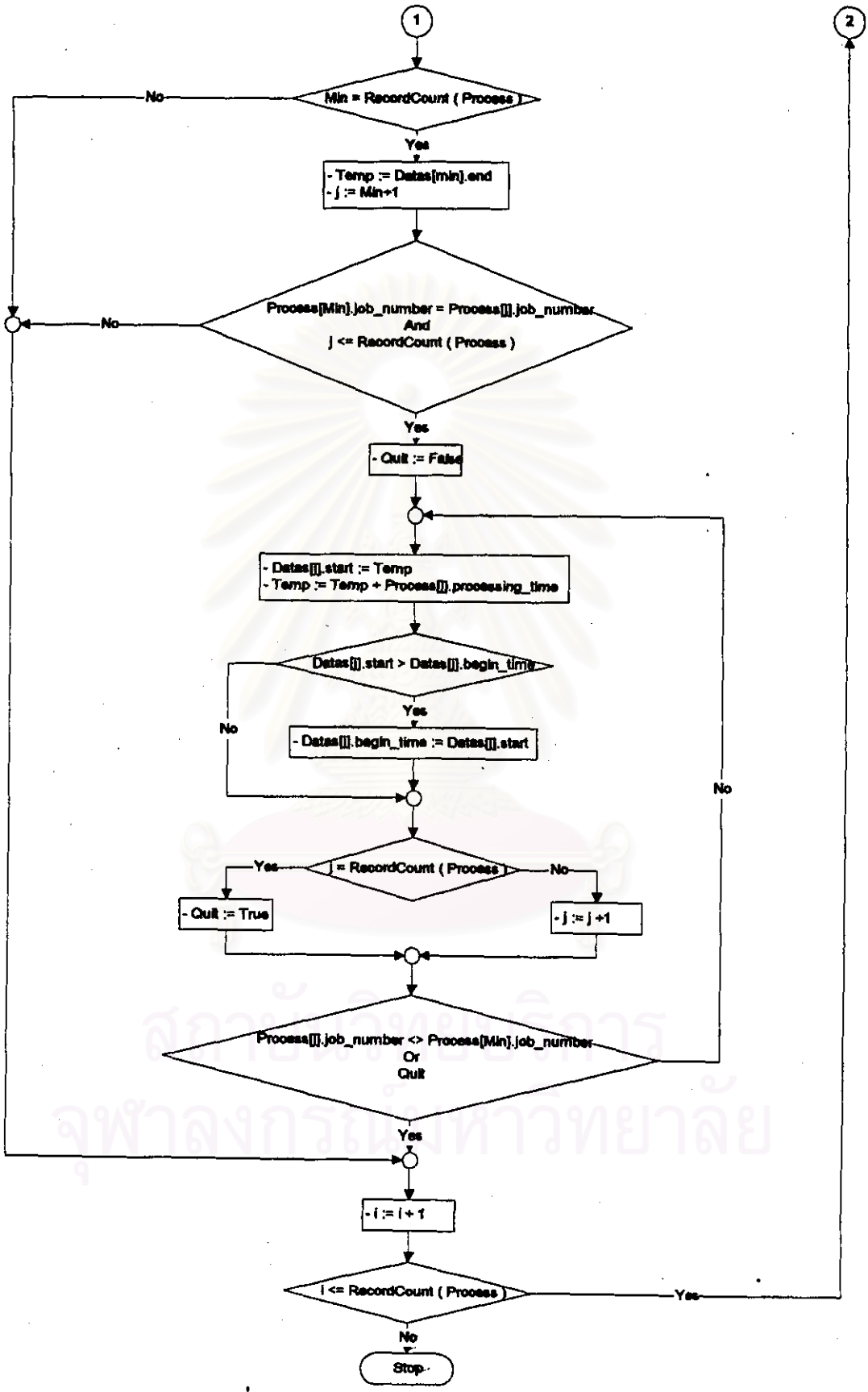


รูปที่ 3.21 Flow Chart แสดงการเปลี่ยนของเครื่องจักร

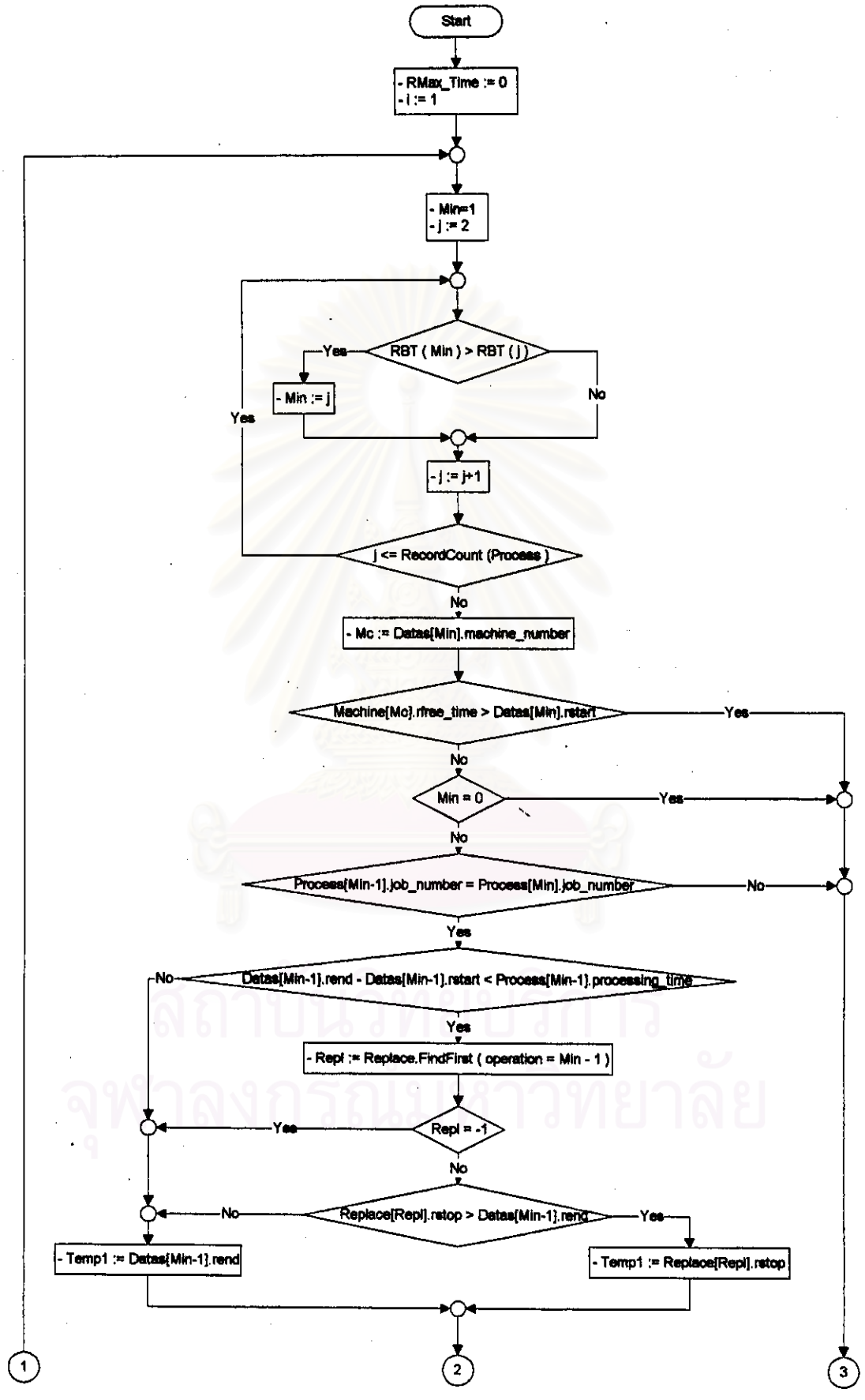


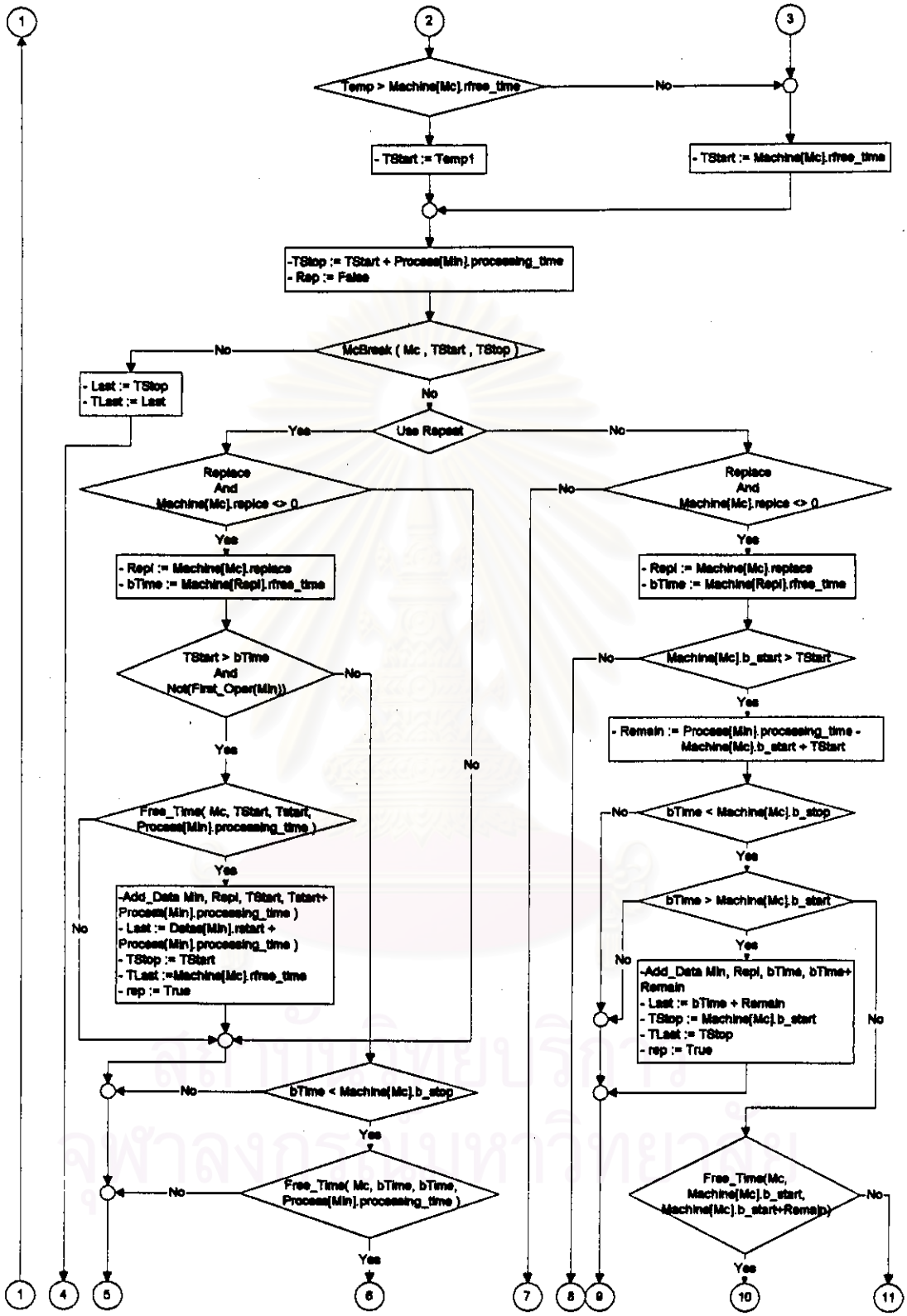
รูปที่ ง.22 Flow Chart แสดงการเปลี่ยนของเครื่องจักร

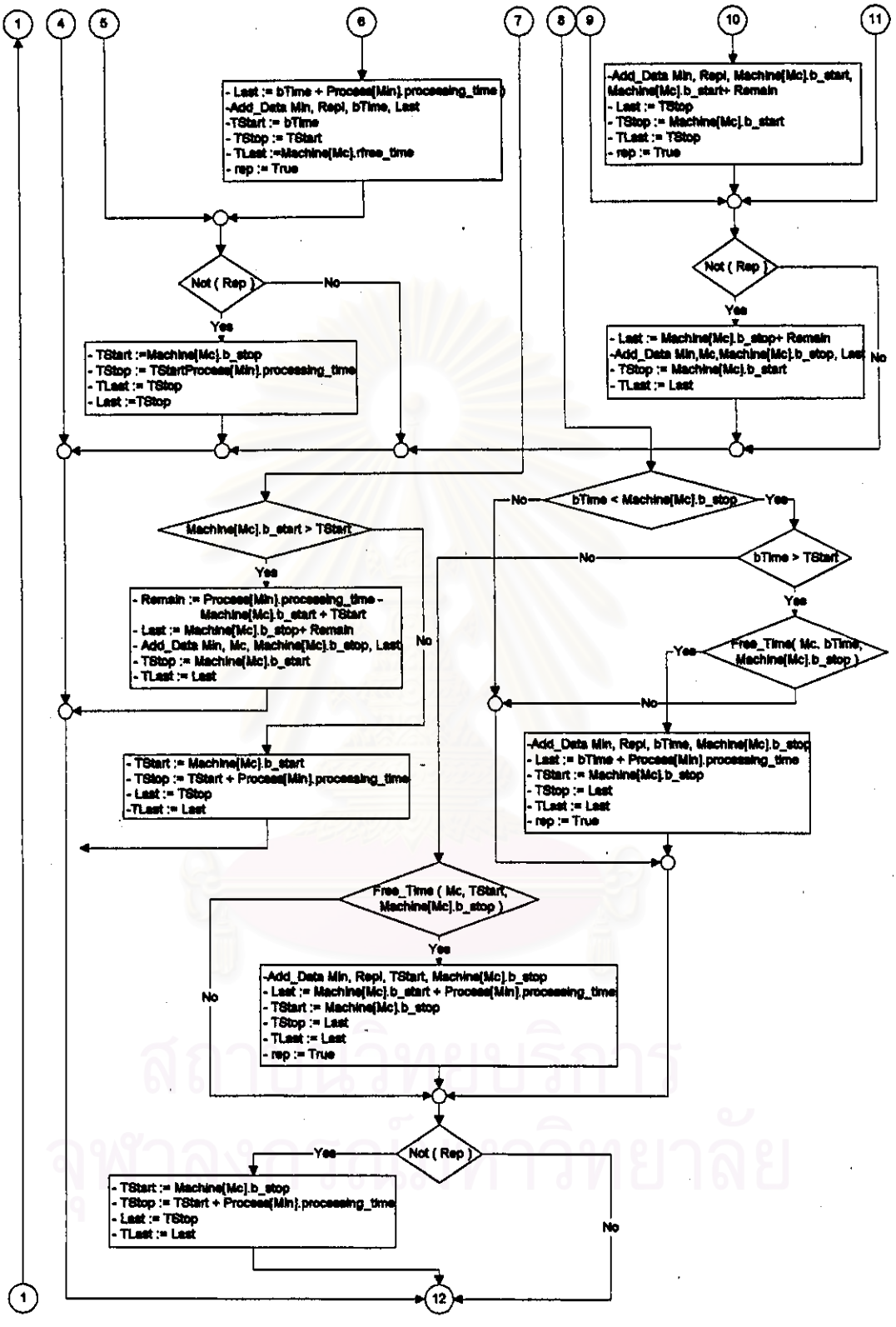

ReArrange (Oper as Integer , Pos as Double)
- Max_Time := 0
- i := 1
- Min := 1
- j := 2
BT(Min) > BT(j)
Or
(BT(Min) = BT(j)) And (j = Oper)
Yes
- Min := j
No
Yes
- j := j + 1
j <= RecordCount (Process)
No
- Mc := Datas[Min].machine_number
- Delta := Machine[Mc].free_time - Datas[Min].start
Delta > 0
No
Yes
Min > 0
Yes
No
Process[Min].job_number <> Process[Min-1].job_number
Yes
No
Machine[Mc].free_time > Datas[Min-1].end
Yes
No
- Datas[Min].start := Datas[Min-1].end
- Datas[Min].start := Machine[Mc].free_time
- Machine[Mc].free_time := Datas[Min].start + Process[Min].processing_time
- Datas[Min].end := Machine[Mc].free_time
- Datas[Min].begin_time := 32700
Max_Time < Machine[Mc].free_time
Yes
No
- Max_Time := Machine[Mc].free_time
1
2

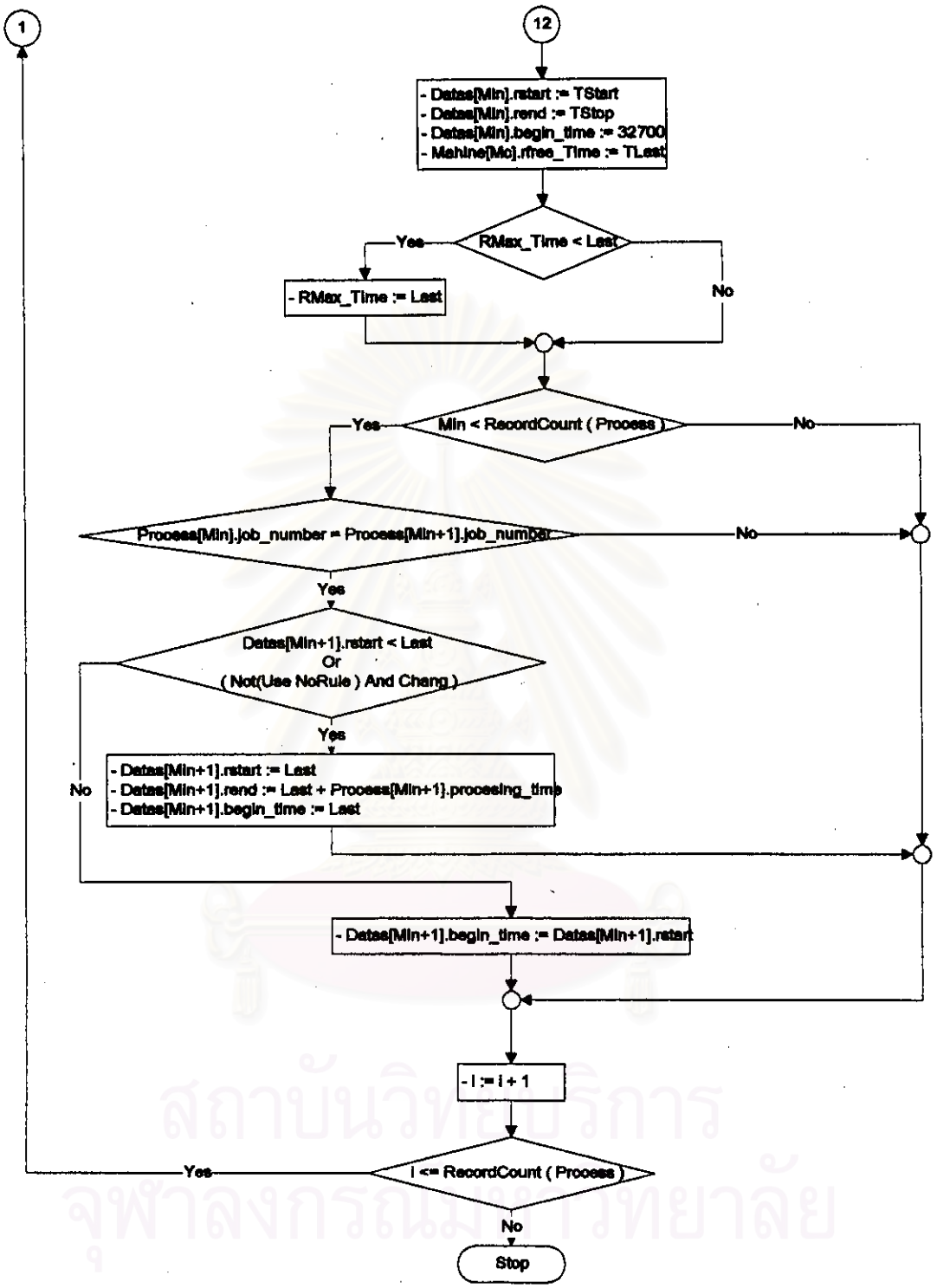


รูปที่ 4.22 Flow Chart แสดงการจัดตารางใหม่

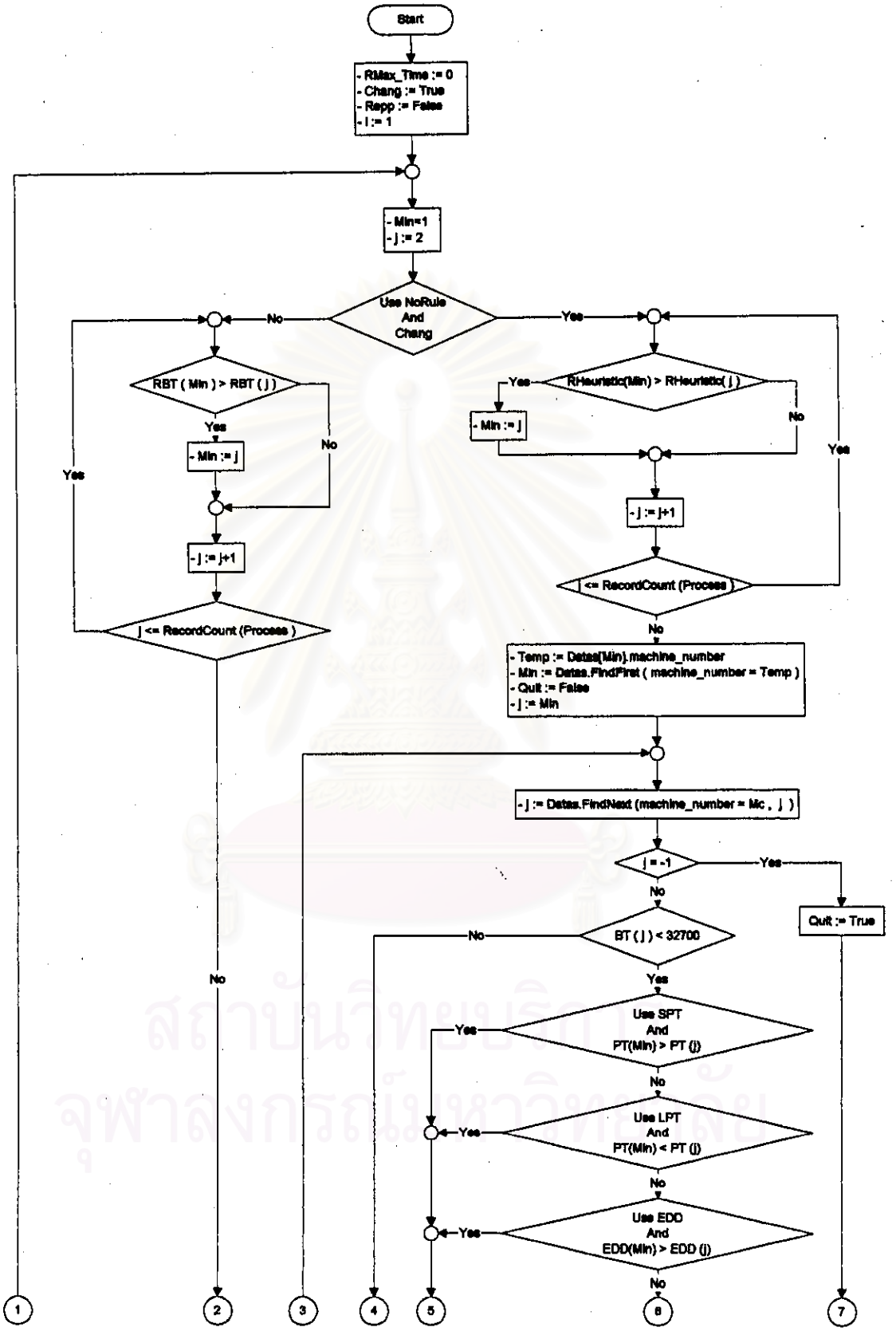

Start
- RMax_Time := 0
- I := 1
- Min=1
- J := 2
RBT (Min) > RBT (J)
Yes
No
- Min := J
Yes
- J := J+1
J <= RecordCount (Process)
No
- Mc := Datas[Min].machine_number
Machine[Mc].rfree_time > Datas[Min].rstart
Yes
No
Min = 0
Yes
No
Process[Min-1].job_number = Process[Min].job_number
No
Yes
No
Datas[Min-1].rend - Datas[Min-1].rstart < Process[Min-1].processing_time
Yes
- Repl := Replace.FindFirst (operation = Min - 1)
Repl = -1
Yes
No
Replace[Repl].rstop > Datas[Min-1].rend
No
Yes
- Temp1 := Datas[Min-1].rend
- Temp1 := Replace[Repl].rstop
1
2
3

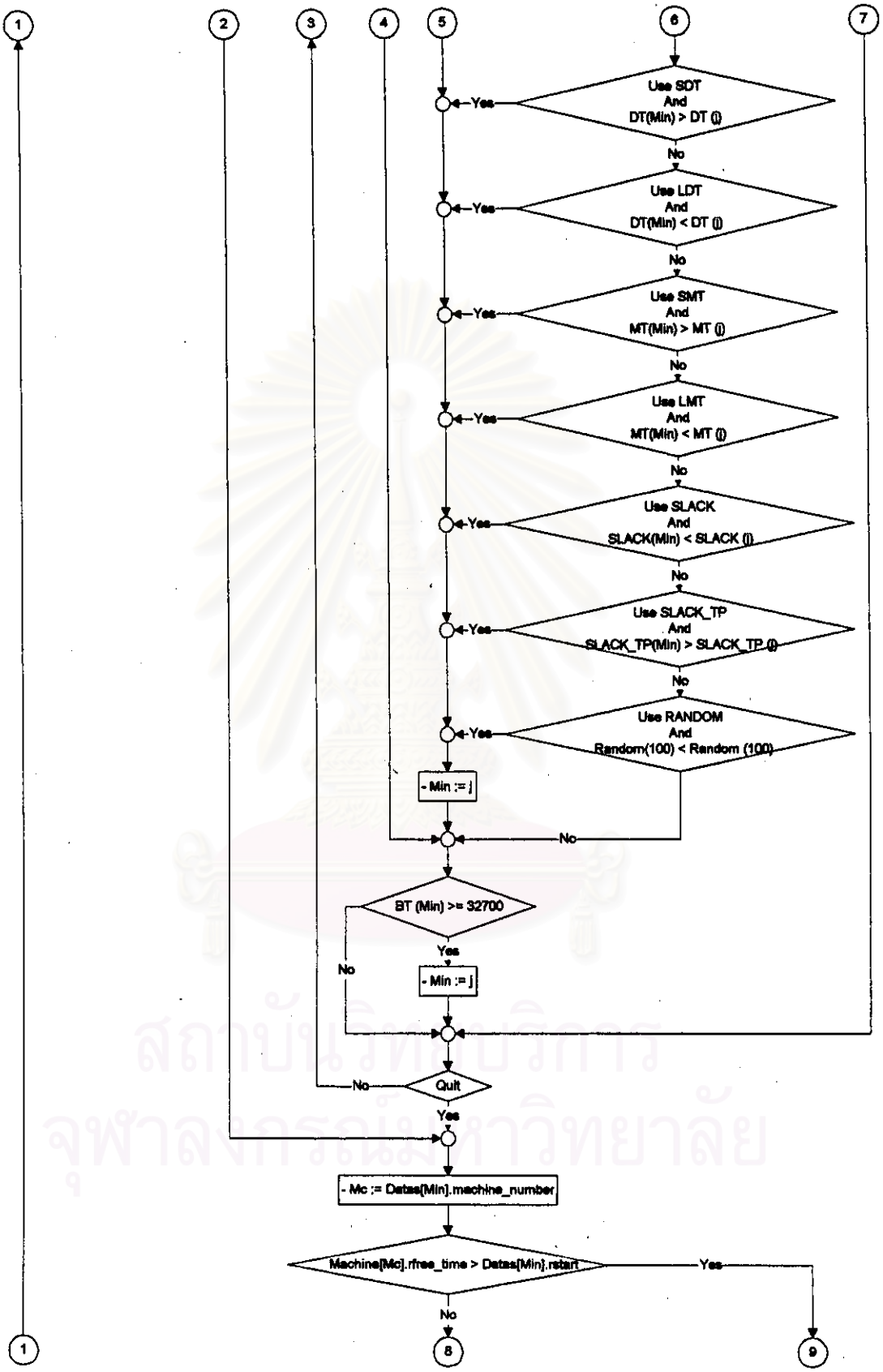

1
2
3
Temp > Machine[Mc].rfree_time
No
- TStart := Temp1
- TStart := Machine[Mc].rfree_time
-TStop := TStart + Process[Min].processing_time
- Rep := False
McBreak (Mc , TStart , TStop)
No
- Last := TStop
- TLast := Last
Yes
Use Repeat
No
Replace And Machine[Mc].replce <> 0
Yes
- Repl := Machine[Mc].replace
- bTime := Machine[Repl].rfree_time
TStart > bTime And Not(First_Oper(Min))
No
Yes
Free_Time(Mc, TStart, Tstart, Process[Min].processing_time)
Yes
-Add_Data Min, Repl, TStart, Tstart+ Process[Min].processing_time)
- Last := Datas[Min].rstart + Process[Min].processing_time)
- TStop := TStart
- TLast :=Machine[Mc].rfree_time
- rep := True
No
No
bTime < Machine[Mc].b_stop
Yes
Free_Time(Mc, bTime, bTime, Process[Min].processing_time)
Yes
No
No
Replace And Machine[Mc].replce <> 0
Yes
- Repl := Machine[Mc].replace
- bTime := Machine[Repl].rfree_time
No
Machine[Mc].b_start > TStart
Yes
- Remain := Process[Min].processing_time - Machine[Mc].b_start + TStart
No
bTime < Machine[Mc].b_stop
Yes
bTime > Machine[Mc].b_start
Yes
No
-Add_Data Min, Repl, bTime, bTime+ Remain
- Last := bTime + Remain
- TStop := Machine[Mc].b_start
- TLast := TStop
- rep := True
No
Free_Time(Mc, Machine[Mc].b_start, Machine[Mc].b_start+Remain)
No
Yes
1
4
5
6
7
8
9
10
11

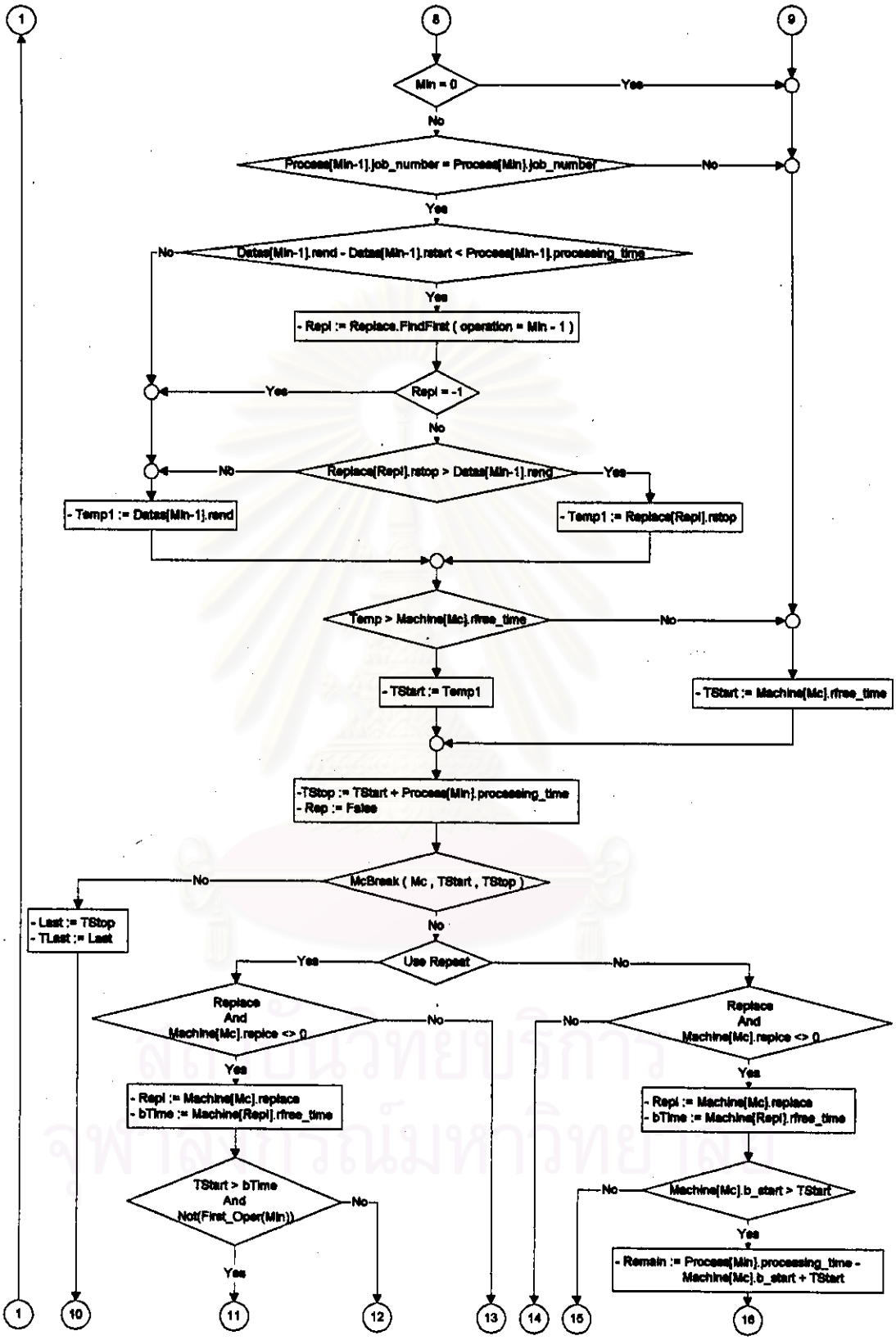

1
4
5
6
7
8
9
10
11
- Last := bTime + Process[Min].processing_time
-Add_Data Min, Repi, bTime, Last
-TStart := bTime
- TStop := TStart
- TLast :=Machine[Mc].rfree_time
- rep := True
-Add_Data Min, Repi, Machine[Mc].b_start, Machine[Mc].b_start+ Remain
- Last := TStop
- TStop := Machine[Mc].b_start
- TLast := TStop
- rep := True
Not (Rep)
No
Yes
- TStart :=Machine[Mc].b_stop
- TStop := TStartProcess[Min].processing_time
- TLast := TStop
- Last :=TStop
- Last := Machine[Mc].b_stop+ Remain
-Add_Data Min,Mc,Machine[Mc].b_stop, Last
- TStop := Machine[Mc].b_start
- TLast := Last
No
Machine[Mc].b_start > TStart
Yes
- Remain := Process[Min].processing_time - Machine[Mc].b_start + TStart
- Last := Machine[Mc].b_stop+ Remain
- Add_Data Min, Mc, Machine[Mc].b_stop, Last
- TStop := Machine[Mc].b_start
- TLast := Last
No
- TStart := Machine[Mc].b_start
- TStop := TStart + Process[Min].processing_time
- Last := TStop
-TLast := Last
bTime < Machine[Mc].b_stop
No
Yes
bTime > TStart
No
Yes
Free_Time(Mc, bTime, Machine[Mc].b_stop)
Yes
No
-Add_Data Min, Repi, bTime, Machine[Mc].b_stop
- Last := bTime + Process[Min].processing_time
- TStart := Machine[Mc].b_stop
- TStop := Last
- TLast := Last
- rep := True
Free_Time (Mc, TStart, Machine[Mc].b_stop)
Yes
No
-Add_Data Min, Repi, TStart, Machine[Mc].b_stop
- Last := Machine[Mc].b_start + Process[Min].processing_time
- TStart := Machine[Mc].b_stop
- TStop := Last
- TLast := Last
- rep := True
Not (Rep)
Yes
No
- TStart := Machine[Mc].b_stop
- TStop := TStart + Process[Min].processing_time
- Last := TStop
- TLast := Last
1
12

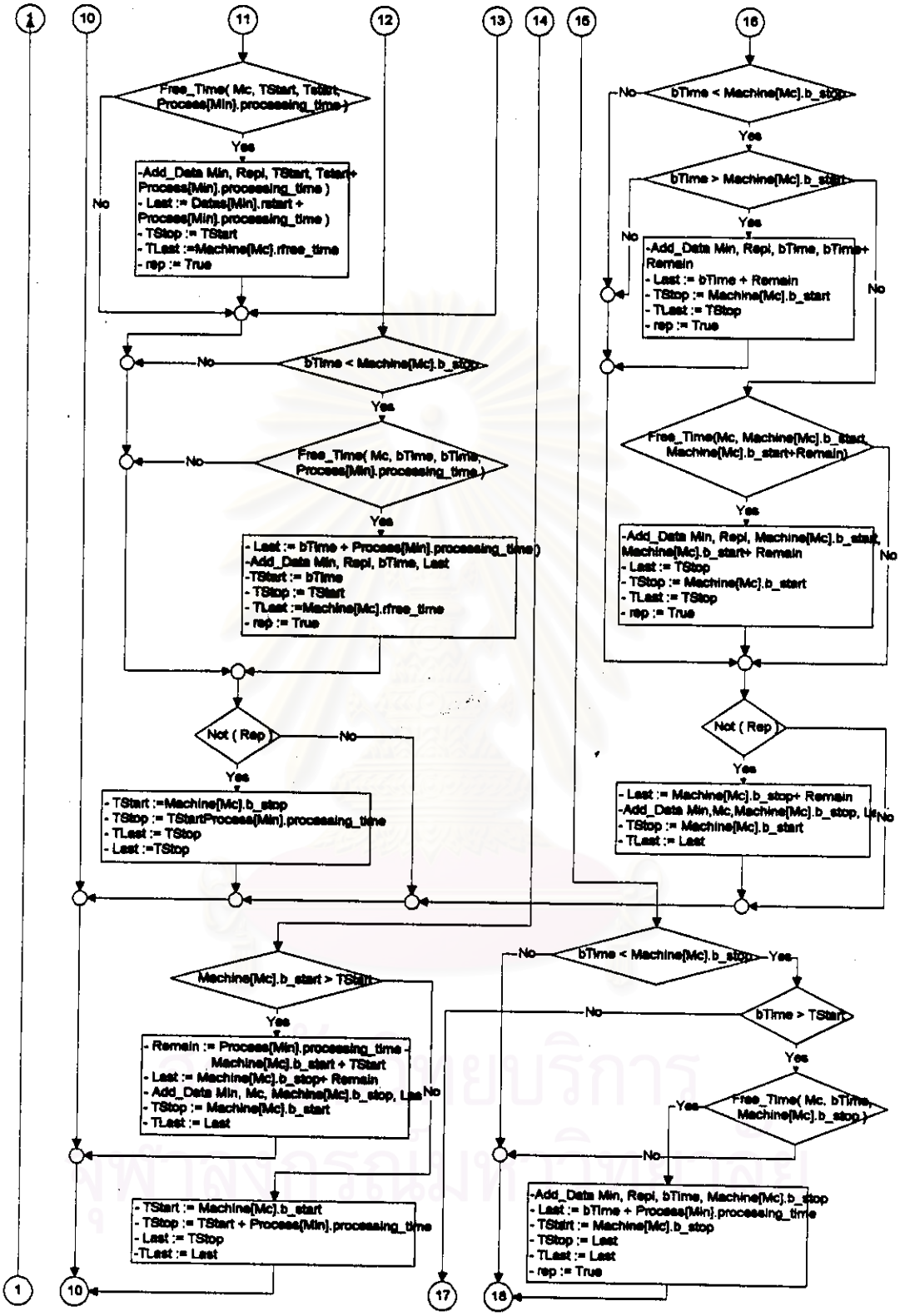


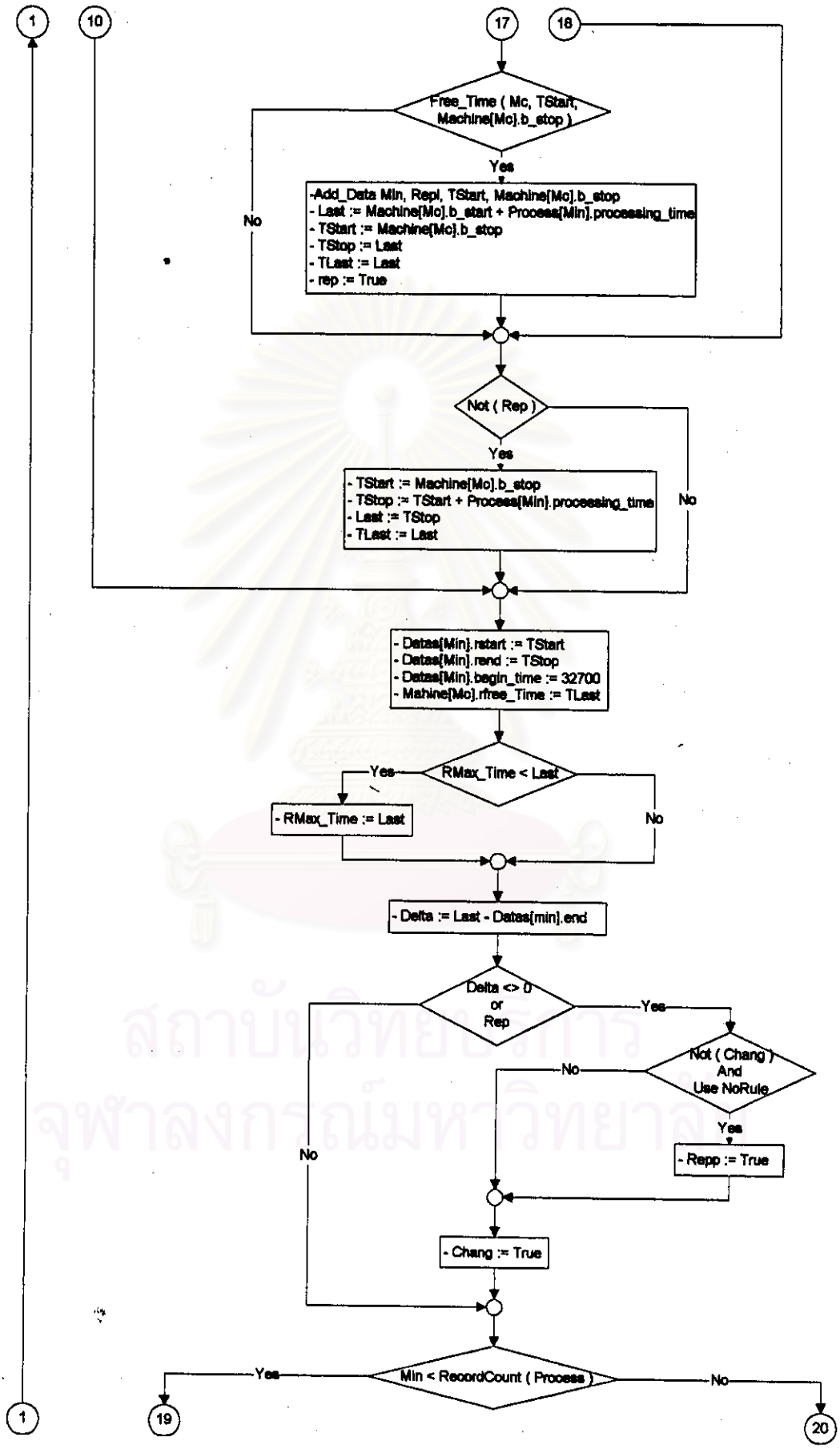
รูปที่ ง.24 Flow Chart แสดงการเปลี่ยนตารางใหม่

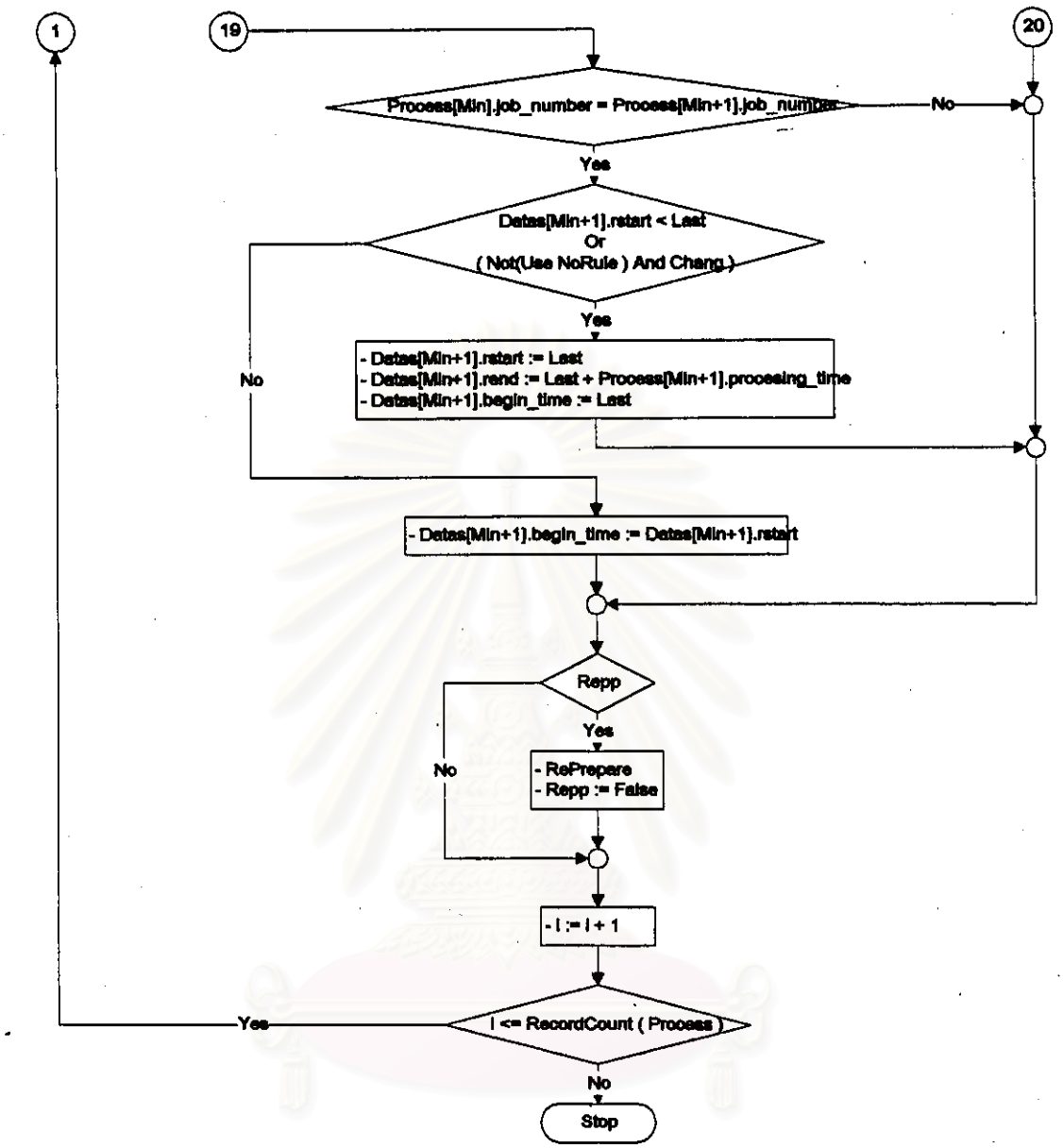

Start
- RMax_Time := 0
- Chang := True
- Repp := False
- I := 1
- Min=1
- J := 2
Use NoRule And Chang
No
Yes
RBT (Min) > RBT (J)
Yes
No
- Min := J
- J := J+1
J <= RecordCount (Process)
Yes
No
RHeuristic(Min) > RHeuristic(J)
Yes
No
- Min := J
- J := J+1
J <= RecordCount (Process)
Yes
No
- Temp := Datas[Min].machine_number
- Min := Datas.FindFirst (machine_number = Temp)
- Quit := False
- J := Min
- J := Datas.FindNext (machine_number = Mc , J)
J = -1
Yes
No
Quit := True
BT (J) < 32700
No
Yes
Use SPT And PT(Min) > PT (j)
Yes
No
Use LPT And PT(Min) < PT (j)
Yes
No
Use EDD And EDD(Min) > EDD (j)
Yes
No
1
2
3
4
5
6
7


1
2
3
4
5
6
7
Use SDT And DT(Min) > DT (j)
Yes
No
Use LDT And DT(Min) < DT (j)
Yes
No
Use SMT And MT(Min) > MT (j)
Yes
No
Use LMT And MT(Min) < MT (j)
Yes
No
Use SLACK And SLACK(Min) < SLACK (j)
Yes
No
Use SLACK_TP And SLACK_TP(Min) > SLACK_TP (j)
Yes
No
Use RANDOM And Random(100) < Random (100)
Yes
- Min := j
No
BT (Min) >= 32700
Yes
No
- Min := j
Quit
No
Yes
- Mc := Datas[Min].machine_number
Machine[Mc].rfree_time > Datas[Min].rstart
Yes
No
1
8
9


1
8
9
Min = 0
Yes
No
Process[Min-1].job_number = Process[Min].job_number
No
Yes
No
Datas[Min-1].rend - Datas[Min-1].rstart < Process[Min-1].processing_time
Yes
- Repl := Replace.FindFirst (operation = Min - 1)
Repl = -1
Yes
No
No
Replace[Repl].rstop > Datas[Min-1].rend
Yes
- Temp1 := Datas[Min-1].rend
- Temp1 := Replace[Repl].rstop
Temp > Machine[Mc].rfree_time
No
- TStart := Temp1
- TStart := Machine[Mc].rfree_time
-TStop := TStart + Process[Min].processing_time
- Rep := False
McBreak (Mc , TStart , TStop)
No
- Last := TStop
- TLast := Last
No
Use Repeat
Yes
No
Replace And Machine[Mc].repice <> 0
No
Yes
- Repl := Machine[Mc].replace
- bTime := Machine[Repl].rfree_time
TStart > bTime And Not(First_Oper(Min))
No
Yes
Replace And Machine[Mc].repice <> 0
No
Yes
- Repl := Machine[Mc].replace
- bTime := Machine[Repl].rfree_time
Machine[Mc].b_start > TStart
No
Yes
- Remain := Process[Min].processing_time - Machine[Mc].b_start + TStart
1
10
11
12
13
14
15
16


1
10
11
12
13
14
15
16
Free_Time(Mc, TStart, Tstart+ Process[Min].processing_time)
Yes
No
-Add_Data Min, Repi, TStart, Tstart+ Process[Min].processing_time)
- Last := Datas[Min].rstart + Process[Min].processing_time)
- TStop := TStart
- TLast :=Machine[Mc].rfree_time
- rep := True
bTime < Machine[Mc].b_stop
No
Yes
Free_Time(Mc, bTime, bTime+ Process[Min].processing_time)
- Last := bTime + Process[Min].processing_time)
-Add_Data Min, Repi, bTime, Last
-TStart := bTime
- TStop := TStart
- TLast :=Machine[Mc].rfree_time
- rep := True
Not (Rep)
- TStart :=Machine[Mc].b_stop
- TStop := TStartProcess[Min].processing_time
- TLast := TStop
- Last :=TStop
bTime < Machine[Mc].b_stop
bTime > Machine[Mc].b_start
-Add_Data Min, Repi, bTime, bTime+ Remain
- Last := bTime + Remain
- TStop := Machine[Mc].b_start
- TLast := TStop
- rep := True
Free_Time(Mc, Machine[Mc].b_start, Machine[Mc].b_start+Remain)
-Add_Data Min, Repi, Machine[Mc].b_start, Machine[Mc].b_start+ Remain
- Last := TStop
- TStop := Machine[Mc].b_start
- TLast := TStop
- rep := True
Not (Rep)
- Last := Machine[Mc].b_stop+ Remain
-Add_Data Min,Mc,Machine[Mc].b_stop, La
- TStop := Machine[Mc].b_start
- TLast := Last
Machine[Mc].b_start > TStart
- Remain := Process[Min].processing_time - Machine[Mc].b_start + TStart
- Last := Machine[Mc].b_stop+ Remain
- Add_Data Min, Mc, Machine[Mc].b_stop, Las
- TStop := Machine[Mc].b_start
- TLast := Last
- TStart := Machine[Mc].b_start
- TStop := TStart + Process[Min].processing_time
- Last := TStop
-TLast := Last
bTime < Machine[Mc].b_stop
bTime > TStart
Free_Time(Mc, bTime, Machine[Mc].b_stop)
-Add_Data Min, Repi, bTime, Machine[Mc].b_stop
- Last := bTime + Process[Min].processing_time
- TStart := Machine[Mc].b_stop
- TStop := Last
- TLast := Last
- rep := True
17
18


1
10
17
18
Free_Time (Mc, TStart, Machine[Mc].b_stop)
Yes
No
-Add_Data Min, Repl, TStart, Machine[Mc].b_stop
- Last := Machine[Mc].b_start + Process[Min].processing_time
- TStart := Machine[Mc].b_stop
- TStop := Last
- TLast := Last
- rep := True
Not (Rep)
Yes
No
- TStart := Machine[Mc].b_stop
- TStop := TStart + Process[Min].processing_time
- Last := TStop
- TLast := Last
- Datas[Min].rstart := TStart
- Datas[Min].rend := TStop
- Datas[Min].begin_time := 32700
- Mahine[Mc].rfree_Time := TLast
RMax_Time < Last
Yes
No
- RMax_Time := Last
- Delta := Last - Datas[min].end
Delta <> 0 or Rep
Yes
No
Not (Chang) And Use NoRule
No
Yes
- Repp := True
- Chang := True
Min < RecordCount (Process)
Yes
No
1
19
20



รูปที่ 3.25 Flow Chart แสดงการสร้าง Gantt Chart

```
VERSION 4.00
Begin VB.Form Chart
   AutoRedraw      =  -1  'True
   Caption         =  "Scheduling Machine Chart"
   ClientHeight    =  5385
   ClientLeft      =  1365
   ClientTop       =  1920
   ClientWidth     =  7200
   BeginProperty Font
      name            =  "Courier"
      charset         =  0
      weight          =  700
      size            =  9.75
      underline       =  0   'False
      italic          =  0   'False
      strikethrough   =  0   'False
   EndProperty
   Height          =  5790
   Left            =  1305
   LinkTopic       =  "Form1"
   ScaleHeight     =  5385
   ScaleWidth      =  7200
   Top             =  1575
   Width           =  7320
   Begin VB.CommandButton Obj
      BeginProperty Font
         name            =  "MS Sans Serif"
         charset         =  222
         weight          =  700
         size            =  8.25
         underline       =  0   'False
         italic          =  0   'False
         strikethrough   =  0   'False
      EndProperty
      Height          =  375
      Left            =  3600
      TabIndex        =  2
      Top             =  1440
      Visible         =  0   'False
      Width           =  855
   End
   Begin VB.ComboBox Zoom
      BeginProperty Font
         name            =  "MS Sans Serif"
         charset         =  222
         weight          =  700
         size            =  8.25
         underline       =  0   'False
         italic          =  0   'False
         strikethrough   =  0   'False
      EndProperty
      Height          =  315
      ItemData        =  "CHART.frx":0000
      Left            =  720
      List            =  "CHART.frx":0010
```

```
  TabIndex      = 7
  Text          = "Over View"
  Top           = 4920
  Width         = 1455
End
Begin VB.HScrollBar Scroll_X
  Height        = 255
  Left          = 840
  TabIndex      = 6
  Top           = 4440
  Visible       = 0  'False
  Width         = 5895
End
Begin VB.VScrollBar Scroll_Y
  Height        = 3855
  Left          = 6840
  TabIndex      = 5
  Top           = 480
  Visible       = 0  'False
  Width         = 255
End
Begin VB.PictureBox Scale_X
  AutoRedraw    = -1  'True
  Height        = 255
  Left          = 840
  ScaleHeight   = 195
  ScaleWidth    = 5835
  TabIndex      = 4
  Top           = 120
  Width         = 5895
End
Begin VB.PictureBox Numbe
  AutoRedraw    = -1  'True
  Height        = 3855
  Left          = 240
  ScaleHeight   = 3795
  ScaleWidth    = 435
  TabIndex      = 3
  Top           = 480
  Width         = 495
End
Begin VB.CommandButton Quit
  Caption       = "&Close"
  BeginProperty Font
    name            = "MS Sans Serif"
    charset         = 222
    weight          = 700
    size            = 8.25
    underline       = 0  'False
    italic          = 0  'False
    strikethrough   = 0  'False
  EndProperty
  Height        = 375
  Left          = 3000
  TabIndex      = 1
```

```
    Top             =   4800
    Width           =   1215
  End
  Begin VB.PictureBox Graph
    AutoRedraw      =   -1  'True
    BeginProperty Font
      name          =   "MS Sans Serif"
      charset       =   222
      weight        =   700
      size          =   8.25
      underline     =   0   'False
      italic        =   0   'False
      strikethrough =   0   'False
    EndProperty
    Height          =   3870
    Left            =   840
    ScaleHeight     =   3810
    ScaleWidth      =   5865
    TabIndex        =   0
    Top             =   480
    Width           =   5925
  End
  Begin VB.Label Label1
    AutoSize        =   -1  'True
    Caption         =   "Zoom"
    BeginProperty Font
      name          =   "MS Sans Serif"
      charset       =   222
      weight        =   700
      size          =   8.25
      underline     =   0   'False
      italic        =   0   'False
      strikethrough =   0   'False
    EndProperty
    Height          =   195
    Left            =   120
    TabIndex        =   8
    Top             =   5040
    Width           =   465
  End
End
Attribute VB_Name = "Chart"
Attribute VB_Creatable = False
Attribute VB_Exposed = False
Dim X_size, Y_size As Long
Dim Begin_X, Begin_Y As Long
Dim Oper_Point, Least As Integer
Dim Old_Y As Long
Dim first_in As Boolean
Sub Arrange_form()
    Scroll_X.Height = 250
    Scroll_Y.Width = 250
    Label1.Left = 100
    Label1.Top = Chart.Height - 700
    Zoom.Left = Label1.Left + Label1.Width + 120
```

```
Zoom.Top = Label1.Top - 100
scale_x.Height = 250
scale_x.Top = 100
Number.Left = 100
Number.Width = 400
scale_x.Left = Number.Left + Number.Width + 50
Number.Top = scale_x.Top + scale_x.Height + 50
Graph.Left = scale_x.Left
Graph.Top = Number.Top
Quit.Left = Int((Chart.Width - Quit.Width) / 2)
Quit.Top = Chart.Height - 900
scale_x.Width = Chart.Width - Graph.Left - 200
Number.Height = Quit.Top - Graph.Top - 200
X_size = Int((scale_x.Width - 70) / Max_Time)
Y_size = Int((Number.Height - 60) / Dat.machine.Recordset.RecordCount)
Select Case Zoom.ListIndex
Case 0 'Over View
   Begin_X = 0
   Begin_Y = 0
   Scroll_X.Visible = False
   Scroll_Y.Visible = False
Case 1 '200%
   If (X_size < 300) Or (Y_size < 1000) Then
      If Y_size < 1000 Then scale_x.Width = scale_x.Width - 350
      If X_size < 300 Then Number.Height = Number.Height - 350
      If Y_size < 1000 Then
         Y_size = Int((Number.Height - 60) / CInt(Dat.machine.Recordset.RecordCount / 2 + 0.005))
         Scroll_Y.Visible = True
         Scroll_Y.Max = Dat.machine.Recordset.RecordCount - CInt(Dat.machine.Recordset.RecordCount / 2
+ 0.005)
         Scroll_Y.LargeChange = CInt(Scroll_Y.Max * 0.11) + 1
         If Begin_Y > Scroll_Y.Max Then
            Begin_Y = Scroll_Y.Max
         End If
      Else
         Y_size = Int((Number.Height - 60) / Dat.machine.Recordset.RecordCount)
         Begin_Y = 0
         Scroll_Y.Visible = False
      End If
      If X_size < 300 Then
         X_size = Int(2 * (scale_x.Width - 70) / (Max_Time))
         Scroll_X.Visible = True
         Scroll_X.Max = Max_Time - Int(scale_x.Width / X_size)
         Scroll_X.LargeChange = CInt(Scroll_X.Max * 0.11) + 1
      Else
         X_size = Int((scale_x.Width - 70) / (Max_Time))
         Begin_X = 0
         Scroll_X.Visible = False
      End If
      Scroll_X.Top = Number.Top + Number.Height + 100
      Scroll_Y.Left = scale_x.Left + scale_x.Width + 100
   Else
      Scroll_X.Visible = False
      Scroll_Y.Visible = False
   End If
```

```
    Case 2 '400%
        If (X_size < 300) Or (Y_size < 1000) Then
            If Y_size < 1000 Then scale_x.Width = scale_x.Width - 350
            If X_size < 300 Then Number.Height = Number.Height - 350
            If Y_size < 1000 Then
                Y_size = Int((Number.Height - 60) / CInt(Dat.machine.Recordset.RecordCount / 4 + 0.5))
                Scroll_Y.Visible = True
                Scroll_Y.Max = Dat.machine.Recordset.RecordCount - CInt(Dat.machine.Recordset.RecordCount / 4
+ 0.5)
                Scroll_Y.LargeChange = CInt(Scroll_Y.Max * 0.11) + 1
                If Begin_Y > Scroll_Y.Max Then
                    Begin_Y = Scroll_Y.Max
                End If
            Else
                Y_size = Int((Number.Height - 60) / Dat.machine.Recordset.RecordCount)
                Begin_Y = 0
                Scroll_Y.Visible = False
            End If
            If X_size < 300 Then
                X_size = Int(4 * (scale_x.Width - 70) / (Max_Time))
                Scroll_X.Visible = True
                Scroll_X.Max = Max_Time - Int(scale_x.Width / X_size)
                Scroll_X.LargeChange = CInt(Scroll_X.Max * 0.11) + 1
            Else
                X_size = Int((scale_x.Width - 70) / (Max_Time))
                Begin_X = 0
                Scroll_X.Visible = False
            End If
            Scroll_X.Top = Number.Top + Number.Height + 100
            Scroll_Y.Left = scale_x.Left + scale_x.Width + 100
        Else
            Scroll_X.Visible = False
            Scroll_Y.Visible = False
        End If
    Case 3 'Detail View
        If (X_size < 300) Or (Y_size < 1000) Then
            If Y_size < 1000 Then scale_x.Width = scale_x.Width - 350
            If X_size < 300 Then Number.Height = Number.Height - 350
            If Y_size < 1000 Then
                temp = Int((Number.Height - 60) / 1000)
                Y_size = Int((Number.Height - 60) / temp)
                Scroll_Y.Visible = True
                Scroll_Y.Max = Dat.machine.Recordset.RecordCount - temp
                Scroll_Y.LargeChange = CInt(Scroll_Y.Max * 0.11) + 1
                If Begin_Y > Scroll_Y.Max Then
                    Begin_Y = Scroll_Y.Max
                End If
            Else
                Y_size = Int((Number.Height - 60) / Dat.machine.Recordset.RecordCount)
                Begin_Y = 0
                Scroll_Y.Visible = False
            End If
            If X_size < 300 Then
                X_size = 300
                Scroll_X.Visible = True
```

```
            Scroll_X.Max = Max_Time - Int(scale_x.Width / X_size)
            Scroll_X.LargeChange = CInt(Scroll_X.Max * 0.11) + 1
         Else
            X_size = Int((scale_x.Width - 70) / (Max_Time))
            Begin_X = 0
            Scroll_X.Visible = False
         End If
         Scroll_X.Top = Number.Top + Number.Height + 100
         Scroll_Y.Left = scale_x.Left + scale_x.Width + 100
      Else
         Scroll_X.Visible = False
         Scroll_Y.Visible = False
      End If
   End Select
   Graph.Width = scale_x.Width
   Graph.Height = Number.Height
   Scroll_X.Left = Graph.Left
   Scroll_X.Width = Graph.Width
   Scroll_Y.Top = Graph.Top
   Scroll_Y.Height = Graph.Height
   Output
End Sub
Sub Out_Box(bx, by, bwidth, bheight As Long, boolor As Long, Dat As String)
   Graph.CurrentX = bx
   Graph.CurrentY = by + 30
   Graph.Line Step(0, 0)-Step(bwidth, bheight - 60), boolor, BF
   Graph.Line Step(0, 0)-Step(-bwidth, 0), QBColor(0), BF
   Graph.Line Step(0, 0)-Step(0, -bheight + 60), QBColor(15), BF
   Graph.Line Step(0, 0)-Step(bwidth, 0), QBColor(15), BF
   Graph.Line Step(0, 0)-Step(0, bheight - 60), QBColor(0), BF
   Graph.CurrentX = bx + Int((bwidth - (Len(Dat) * 100)) / 2)
   Graph.CurrentY = by + Int((bheight - 180) / 2)
   If Graph.CurrentX > bx - 60 Then
      Graph.Print Dat
   End If
End Sub

Sub Output()
   Dim Current, ScaleStep As Integer

   Chart.Caption = "Scheduling Machine Gantt Chart ( " & ChartName & " )"
   Randomize
   Graph.Cls
   Number.Cls
   scale_x.Cls
   Graph.ForeColor = 0
   i = Begin_X
   ScaleStep = Int(1100 / X_size)
   If ScaleStep = 0 Then ScaleStep =
   While ((i - Begin_X) * X_size <= scale_x.Width) And (i <= CInt(Max_Time))
      scale_x.CurrentX = (i - Begin_X) * X_size
```

```
        scale_x.CurrentY = scale_x.Height
        scale_x.Line Step(0, 0)-Step(0, -200), QBColor(0), BF
        temp = Str(i)
        temp = Right(temp, Len(temp) - 1)
        scale_x.CurrentX = scale_x.CurrentX + 20
        scale_x.CurrentY = 0
        scale_x.Print temp
        i = i + ScaleStep
    Wend
    i = Begin_Y
    While (i < Dat.machine.Recordset.RecordCount) And ((i - Begin_Y) * Y_size < Number.Height)
        Number.CurrentX = 40
        Number.CurrentY = (i - Begin_Y) * Y_size + Int(Y_size / 2) - 120
        Number.Print i + 1
        i = i + 1
    Wend
    Dat.process.Recordset.MoveFirst
    Dat.job.Recordset.MoveFirst
    Current = Dat.process.Recordset("job_number")
    Color = 1
    For i = 0 To Dat.datas.Recordset.RecordCount - 1
        Dat.datas.Recordset.AbsolutePosition = i
        Dat.process.Recordset.AbsolutePosition = i
        pX = (Dat.datas.Recordset("start") - Begin_X) * X_size
        pY = (Dat.datas.Recordset("machine_number") - Begin_Y) * Y_size
        pW = Int((Dat.datas.Recordset("end") - Dat.datas.Recordset("start")) * X_size)
        If Current <> Dat.process.Recordset("job_number") Then
            Current = Dat.process.Recordset("job_number")
            Color = Color + 1
            If Color = 4 Then Color = Color + 1
            Dat.job.Recordset.MoveNext
        End If
        If Y_size > 0 Then
            If Y_size > 720 Then
                Out_Box pX, pY + Int((Y_size - 720) / 2), pW - 16, 700, QBColor(Color),
Dat.datas.Recordset("process_id")
            Else
                Out_Box pX, pY, pW - 16, Y_size - 10, QBColor(Color), Dat.datas.Recordset("process_id")
            End If
        End If
    Next i
End Sub



Private Sub Form_Activate()
    Randomize
    If (Max_Time > 0) Then
        Arrange_form
        If first_in Then
            first_in = False
            Zoom.ListIndex = 0
```

```
        End If
    Else
        temp = MsgBox("Error! Data not ready", vbOKOnly, "Error")
        Chart.Enabled = False
        Chart.Visible = False
        Unload Chart
        Main.Enabled = True
        Main.Visible = True
    End If
End Sub

Private Sub Form_Load()
    first_in = True
End Sub

Private Sub Form_Resize()
    If Not (first_in) Then
        If WindowState <> 1 Then
            If Chart.Height < (2500 + Dat.machine.Recordset.RecordCount * 300) Then
                Chart.Height = (2500 + Dat.machine.Recordset.RecordCount * 300)
            End If
            If Chart.Width < 6500 Then
                Chart.Width = 6500
            End If
            Arrange_form
        End If
    End If
End Sub


Private Sub Form_Unload(Cancel As Integer)
    Chart.Enabled = False
    Chart.Visible = False
    Unload Chart
    Main.Enabled = True
    Main.Visible = True
End Sub

Private Sub Graph_MouseDown(Button As Integer, Shift As Integer, X As Single, Y As Single)
    Dim tY, tX As Double
    Dim aY As Integer
    Dim aX As Single
    Dim temp, temp1 As Long
    Dim found As Boolean
    Dim Message As String

    Graph.CurrentX = X
    Graph.CurrentY = Y
    If Button > 1 Then
        aY = Int(Graph.CurrentY / Y_size)
        If Y_size > 720 Then
            temp = aY * Y_size + Int((Y_size - 720) / 2)
            temp1 = (aY + 1) * Y_size - Int((Y_size - 720) / 2)
        Else
            temp = aY * Y_size
```

```
            temp1 = temp + Y_size
        End If
        If (Graph.CurrentY > temp) And (Graph.CurrentY < temp1) Then
            aY = aY + Begin_Y
            Dat.machine.Recordset.AbsolutePosition = aY
            aX = (Graph.CurrentX / X_size) + Begin_X
            Dat.datas.Recordset.MoveFirst
            found = False
            Do
                If (Dat.datas.Recordset("start") < aX) And (aX < Dat.datas.Recordset("end")) And
(Dat.datas.Recordset("machine_number") = aY) Then
                    found = True
                    Exit Do
                Else
                    If (Dat.datas.Recordset.AbsolutePosition >= Dat.datas.Recordset.RecordCount - 1) Then
                        Exit Do
                    End If
                End If
                Dat.datas.Recordset.MoveNext
            Loop Until (found)
            If found Then
                Dat.process.Recordset.AbsolutePosition = Dat.datas.Recordset.AbsolutePosition
                temp2 = "Job_number = " + Str(Dat.process.Recordset("Job_number"))
                Dat.job.Recordset.FindFirst temp2
                m1 = "Job                    " & Dat.job.Recordset("job_name") & Chr(10) & Chr(13)
                m2 = "Opertion               " & Dat.process.Recordset("process_name") & Chr(10) & Chr(13)
                m3 = "Machine                " & Dat.machine.Recordset("machine_name") & Chr(10) & Chr(13)
                m4 = "Start                  " & Format(Dat.datas.Recordset("start"), "#,##0.00") & Chr(10) &
Chr(13)
                m5 = "End                    " & Format(Dat.datas.Recordset("end"), "#,##0.00") & Chr(10) &
Chr(13)
                m6 = "Processing Time        " & Format(Dat.process.Recordset("processing_time"), "#,##0.00") &
Chr(10) & Chr(13)
                Message = m1 & m2 & m3 & m4 & m5 & m6
                temp = MsgBox(Message, vbOKOnly, "Data")
            End If
        End If
    Else
        tY = Int(Graph.CurrentY / Y_size)
        If Y_size > 720 Then
            temp = tY * Y_size + Int((Y_size - 720) / 2)
            temp1 = (tY + 1) * Y_size - Int((Y_size - 720) / 2)
        Else
            temp = tY * Y_size
            temp1 = temp + Y_size
        End If
        If (Graph.CurrentY > temp) And (Graph.CurrentY < temp1) Then
            tY = tY + Begin_Y
            Dat.machine.Recordset.AbsolutePosition = tY
            tX = Graph.CurrentX / X_size + Begin_X
            Dat.datas.Recordset.MoveFirst
            found = False
            Do
                If (Dat.datas.Recordset("start") < tX) And (tX < Dat.datas.Recordset("end")) And
(Dat.datas.Recordset("machine_number") = tY) Then
```

```
                found = True
                Dat.process.Recordset.AbsolutePosition = Dat.datas.Recordset.AbsolutePosition
                temp = Dat.process.Recordset("job_number")
                If Dat.process.Recordset.AbsolutePosition > 0 Then
                   Dat.process.Recordset.MovePrevious
                   If Dat.process.Recordset("job_number") = temp Then
                      Dat.datas.Recordset.MovePrevious
                      Least = Dat.datas.Recordset("end")
                      Dat.datas.Recordset.MoveNext
                   Else
                      Least = 0
                   End If
                   Dat.process.Recordset.MoveNext
                Else
                   Least = 0
                End If
                Graph.MousePointer = 2
                Oper_Point = Dat.datas.Recordset.AbsolutePosition
                pX = (Dat.datas.Recordset("start") - Begin_X) * X_size
                pY = (Dat.datas.Recordset("machine_number") - Begin_Y) * Y_size
                pW = (Dat.datas.Recordset("end") - Dat.datas.Recordset("start")) * X_size
                Obj.Left = Graph.Left + pX + 30
                Old_Y = Obj.Top
                Obj.Top = Graph.Top + pY + Int((Y_size - 720) / 2) + 26
                Obj.Width = pW - 16
                Obj.Height = 720
                Obj.Caption = Dat.datas.Recordset("process_id")
                Obj.Visible = True
                Exit Do
             Else
                If (Dat.datas.Recordset.AbsolutePosition >= Dat.datas.Recordset.RecordCount - 1) Then
                   Exit Do
                End If
             End If
             Dat.datas.Recordset.MoveNext
          Loop Until (found)
       End If
    End If
End Sub

Private Sub Graph_MouseMove(Button As Integer, Shift As Integer, X As Single, Y As Single)
    If Obj.Visible Then
       temp = Int(X / X_size) + Begin_X
       If temp < Least Then
          temp = Least
       ElseIf temp < Begin_X Then
          Scroll_X.Value = Scroll_X.Value - Int(Begin_X - temp)
       End If
       If temp > Max_Time Then
          temp = Max_Time
       ElseIf temp - Begin_X >= Int((Graph.Width - 70) / X_size) Then
          If Scroll_X.Value < Scroll_X.Max Then
             Scroll_X.Value = Scroll_X.Value + temp - Begin_X - Int((Graph.Width - 70) / X_size)
          End If
       End If
```

```
        Obj.Left = Graph.Left + 30 + (temp - Begin_X) * X_size
    End If
End Sub


Private Sub Graph_MouseUp(Button As Integer, Shift As Integer, X As Single, Y As Single)
    Dim pX As Double
    Dim tX As Integer

    Dat.datas.Recordset.AbsolutePosition = Oper_Point
    tX = Int((Obj.Left - Graph.Left) / X_size) + Begin_X
    If Dat.datas.Recordset("start") <> tX Then
        Beep
        Change_Prepare Oper_Point, tX
        ReArrange Oper_Point, tX
        Gen_Performance
        ScheduleTable.Fill_Table
        Table.Fill_Table
        McTable.Fill_Table
    End If
    Graph.MousePointer = 1
    Obj.Visible = False
    Output
End Sub


Private Sub Quit_Click()
    Chart.Enabled = False
    Chart.Visible = False
    Unload Chart
    Main.Enabled = True
    Main.Visible = True
End Sub



Private Sub Scroll_X_Change()
    Begin_X = Scroll_X.Value
    Output
End Sub
Private Sub Scroll_Y_Change()
    Begin_Y = Scroll_Y.Value
    Output
End Sub

Private Sub Zoom_Click()
    Arrange_form
End Sub
```

```
VERSION 4.00
Begin VB.Form Dat
   ClientHeight    =  765
   ClientLeft      =  315
   ClientTop       =  2805
   ClientWidth     =  8970
   Enabled         =  0  'False
   Height          =  1170
   Left            =  255
   LinkTopic       =  "Form1"
   ScaleHeight     =  765
   ScaleWidth      =  8970
   Top             =  2460
   Visible         =  0  'False
   Width           =  9090
   Begin VB.Data Print_Data
      Caption         =  "Data1"
      Connect         =  "Access"
      DatabaseName    =  "Temp.mdb"
      Exclusive       =  0  'False
      Height          =  495
      Left            =  7560
      Options         =  0
      ReadOnly        =  0  'False
      RecordsetType   =  1  'Dynaset
      RecordSource    =  "Print"
      Top             =  120
      Width           =  1140
   End
   Begin VB.Data Replace
      Caption         =  "Data1"
      Connect         =  "Access"
      DatabaseName    =  "J:\WORK2\Temp.mdb"
      Exclusive       =  0  'False
      Height          =  495
      Left            =  6240
      Options         =  0
      ReadOnly        =  0  'False
      RecordsetType   =  1  'Dynaset
      RecordSource    =  "Replace"
      Top             =  120
      Width           =  1140
   End
   Begin VB.Data Performance
      Connect         =  "Access"
      DatabaseName    =  "TEMP.MDB"
      Enabled         =  0  'False
      Exclusive       =  0  'False
      BeginProperty Font
         name            =  "Angsana New"
         charset         =  222
         weight          =  700
         size            =  14.25
         underline       =  0  'False
         italic          =  0  'False
```

```
    strikethrough   =   0   'False
  EndProperty
  Height          =   510
  Left            =   5040
  Options         =   0
  ReadOnly        =   0   'False
  RecordsetType   =   1   'Dynaset
  RecordSource    =   "Performance"
  Top             =   120
  Visible         =   0   'False
  Width           =   1140
End
Begin VB.Data Datas
  Caption         =   "Data3"
  Connect         =   "Access"
  DatabaseName    =   "TEMP.MDB"
  Enabled         =   0   'False
  Exclusive       =   0   'False
  BeginProperty Font
    name          =   "Angsana New"
    charset       =   222
    weight        =   700
    size          =   14.25
    underline     =   0   'False
    italic        =   0   'False
    strikethrough =   0   'False
  EndProperty
  Height          =   510
  Left            =   3720
  Options         =   0
  ReadOnly        =   0   'False
  RecordsetType   =   1   'Dynaset
  RecordSource    =   "Process"
  Top             =   120
  Visible         =   0   'False
  Width           =   1140
End
Begin VB.Data Machine
  Caption         =   "Data4"
  Connect         =   "Access"
  DatabaseName    =   "TEMP.MDB"
  Enabled         =   0   'False
  Exclusive       =   0   'False
  BeginProperty Font
    name          =   "Angsana New"
    charset       =   222
    weight        =   700
    size          =   14.25
    underline     =   0   'False
    italic        =   0   'False
    strikethrough =   0   'False
  EndProperty
  Height          =   510
  Left            =   2520
  Options         =   0
```

```
    ReadOnly        =  0   'False
    RecordsetType   =  1   'Dynaset
    RecordSource    =  "Machine"
    Top             =  120
    Visible         =  0   'False
    Width           =  1140
  End
  Begin VB.Data Job
    Caption         =  "Data1"
    Connect         =  "Access"
    DatabaseName    =  "DATA.MDB"
    Enabled         =  0   'False
    Exclusive       =  0   'False
    Height          =  525
    Left            =  1200
    Options         =  0
    ReadOnly        =  0   'False
    RecordsetType   =  1   'Dynaset
    RecordSource    =  "Job"
    Top             =  120
    Visible         =  0   'False
    Width           =  1140
  End
  Begin VB.Data Process
    Caption         =  "Data1"
    Connect         =  "Access"
    DatabaseName    =  "data.mdb"
    Enabled         =  0   'False
    Exclusive       =  0   'False
    Height          =  525
    Left            =  0
    Options         =  0
    ReadOnly        =  0   'False
    RecordsetType   =  1   'Dynaset
    RecordSource    =  "Process"
    Top             =  120
    Visible         =  0   'False
    Width           =  1140
  End
End
Attribute VB_Name = "Dat"
Attribute VB_Creatable = False
Attribute VB_Exposed = False
Sub SetPath()
  job.DatabaseName = Data_Pos
  process.DatabaseName = Data_Pos
  datas.DatabaseName = Temp_Pos
  machine.DatabaseName = Temp_Pos
  performance.DatabaseName = Temp_Pos
  Replace.DatabaseName = Temp_Pos
  print_data.DatabaseName = Temp_Pos
  job.Enabled = True
  job.Refresh
  process.Enabled = True
  process.Refresh
```

```
    datas.Enabled = True
    datas.Refresh
    machine.Enabled = True
    machine.Refresh
    performance.Enabled = True
    performance.Refresh
    Replace.Enabled = True'
    Replace.Refresh
    print_data.Enabled = True
    print_data.Refresh
End Sub

Private Sub Data1_Validate(Action As Integer, Save As Integer)

End Sub

Private Sub Form_Load()
    SetPath
End Sub
```

```
VERSION 4.00
Begin VB.Form GenChart
   AutoRedraw      =  -1  'True
   Caption         =  "Generate Chart"
   ClientHeight    =  1395
   ClientLeft      =  1440
   ClientTop       =  3015
   ClientWidth     =  7035
   BeginProperty Font
      name            =  "MS Sans Serif"
      charset         =  222
      weight          =  700
      size            =  8.25
      underline       =  0   'False
      italic          =  0   'False
      strikethrough   =  0   'False
   EndProperty
   Height          =  1800
   Left            =  1380
   LinkTopic       =  "Form1"
   ScaleHeight     =  1395
   ScaleWidth      =  7035
   Top             =  2670
   Width           =  7155
   Begin VB.PictureBox Bar
      AutoRedraw      =  -1  'True
      Height          =  495
      Left            =  120
      ScaleHeight     =  435
      ScaleWidth      =  6195
      TabIndex        =  1
      Top             =  720
      Width           =  6255
   End
   Begin VB.Label Label2
      Alignment       =  2  'Center
      BackStyle       =  0  'Transparent
      Caption         =  "|"
      BeginProperty Font
         name            =  "MS Sans Serif"
         charset         =  222
         weight          =  700
         size            =  14.25
         underline       =  0   'False
         italic          =  0   'False
         strikethrough   =  0   'False
      EndProperty
      Height          =  495
      Left            =  120
      TabIndex        =  3
      Top             =  120
      Width           =  615
   End
   Begin VB.Shape Shape1
      BorderColor     =  &H00FFFFFF&
```

```
    FillColor      =  &H000000FF&
    FillStyle      =  0  'Solid
    Height         =  375
    Left           =  240
    Shape          =  3  'Circle
    Top            =  120
    Width          =  375
  End
  Begin VB.Label Label1
    AutoSize       =  -1  'True
    Caption        =  "Please wait while generating chart."
    Height         =  195
    Left           =  840
    TabIndex       =  2
    Top            =  240
    Width          =  2985
  End
  Begin VB.Label Value
    Alignment      =  1  'Right Justify
    Caption        =  "000%"
    Height         =  195
    Left           =  6480
    TabIndex       =  0
    Top            =  840
    Width          =  450
  End
End
Attribute VB_Name = "GenChart"
Attribute VB_Creatable = False
Attribute VB_Exposed = False



Sub Generate()
  GenChart.Enabled = True
  GenChart.Visible = True
  GenChart.SetFocus
  Prepare
  Gen_Chart
  Gen_Performance
  GenChart.Enabled = False
  GenChart.Visible = False
  Unload GenChart
  Main.SetFocus
  temp = MsgBox("Generate Chart Completely", vbOKOnly, "")
End Sub

Sub Gen_Chart()
  Dim min, j As Integer
  Dim Max As Integer
  Dim tKey As String
  Dim Msave, Quit As Boolean
  Dim cur, Nex As Double
```

```
Max_Time = 0
Max = Dat.process.Recordset.RecordCount ^ 2 - 1
Reset
For i = 1 To Dat.process.Recordset.RecordCount
   min = 0
   For j = 1 To Dat.process.Recordset.RecordCount - 1
      our = Heuristic(min)
      Nex = Heuristic(j)
      If our > Nex Then min = j
      SetValue Int((100 * ((i - 1) * Dat.process.Recordset.RecordCount + j)) / Max)
   Next j
   Dat.datas.Recordset.AbsolutePosition = min
   temp = Dat.datas.Recordset("machine_number")
   tKey = "machine_number =" & Str(temp)
   Dat.datas.Recordset.FindFirst tKey
   min = Dat.datas.Recordset.AbsolutePosition
   Quit = False
   Msave = Mode
   Mode = False
   Do
      Dat.datas.Recordset.FindNext tKey
      If Dat.datas.Recordset.NoMatch Then
         Quit = True
      Else
         j = Dat.datas.Recordset.AbsolutePosition
         our = Heuristic(min)
         Nex = Heuristic(j)
         If Nex < 32700 Then
            If Main.mnuSPT.Checked Then
               If SPT(min) > SPT(j) Then min = j
            ElseIf Main.mnuEDD.Checked Then
               If EDD(min) > EDD(j) Then min = j
            ElseIf Main.mnuSLACK.Checked Then
               If SLACK(min) > SLACK(j) Then min = j
            ElseIf Main.mnuRANDOM.Checked Then
               If RANDOM(min) > RANDOM(j) Then min = j
            ElseIf Main.mnuLPT.Checked Then
               If SPT(min) < SPT(j) Then min = j
            ElseIf Main.mnuSDT.Checked Then
               If DT(min) > DT(j) Then min = j
            ElseIf Main.mnuLDT.Checked Then
               If DT(min) < DT(j) Then min = j
            ElseIf Main.mnuSMT.Checked Then
               If MT(min) > MT(j) Then min = j
            ElseIf Main.mnuLMT.Checked Then
               If MT(min) < MT(j) Then min = j
            ElseIf Main.mnuSlackTP.Checked Then
               If SLACK_TP(min) > SLACK_TP(j) Then min = j
            End If
            If our >= 32700 Then min = j
         End If
      End If
   Loop Until Quit
   Mode = Msave
   Dat.datas.Recordset.AbsolutePosition = min
```

```
        Dat.process.Recordset.AbsolutePosition = min
        Dat.machine.Recordset.AbsolutePosition = Dat.datas.Recordset("machine_number")
        temp = Heuristic(min)
        If Mode Then
            temp = temp - Dat.process.Recordset("processing_time")
        End If
        Dat.datas.Recordset.Edit
        Dat.datas.Recordset("start") = temp
        Dat.datas.Recordset.Update
        Dat.machine.Recordset.Edit
        Dat.machine.Recordset("free_time") = temp + Dat.process.Recordset("processing_time")
        Dat.machine.Recordset.Update
        If Max_Time < Dat.machine.Recordset("free_time") Then
            Max_Time = Dat.machine.Recordset("free_time")
        End If
        Dat.datas.Recordset.Edit
        Dat.datas.Recordset("end") = Dat.machine.Recordset("free_time")
        Dat.datas.Recordset("begin_time") = 32700
        Dat.datas.Recordset.Update
        If min < Dat.process.Recordset.RecordCount - 1 Then
            temp = Dat.process.Recordset("job_number")
            temp2 = Dat.datas.Recordset("end")
            Dat.process.Recordset.MoveNext
            If Dat.process.Recordset("job_number") = temp Then
                Dat.datas.Recordset.MoveNext
                Dat.datas.Recordset.Edit
                Dat.datas.Recordset("begin_time") = temp2
                Dat.datas.Recordset.Update
            End If
        End If
    Next i
    If Main.mnuSPT.Checked Then
        ChartName = "SPT"
    Elself Main.mnuEDD.Checked Then
        ChartName = "EDD"
    Elself Main.mnuSLACK.Checked Then
        ChartName = "SLACK"
    Elself Main.mnuRANDOM.Checked Then
        ChartName = "Random"
    Elself Main.mnuLPT.Checked Then
        ChartName = "LPT"
    Elself Main.mnuSDT.Checked Then
        ChartName = "SDT"
    Elself Main.mnuLDT.Checked Then
        ChartName = "LDT"
    Elself Main.mnuSMT.Checked Then
        ChartName = "SMT"
    Elself Main.mnuLMT.Checked Then
        ChartName = "LMT"
    Elself Main.mnuSlackTP.Checked Then
        ChartName = "Slack/TP"
    End If
End Sub
Sub SetValue(num As Integer)
    Value.Caption = Format(num, "000") & "%"
```

```
    Bar.CurrentX = 0
    Bar.CurrentY = 0
    Bar.Line Step(0, 0)-Step(Int((num * Bar.Width) / 100), Bar.Height), QBColor(1), BF
    GenChart.Refresh
End Sub
Sub Prepare()
    Dim First, PCtime As Integer

    Clear_Record Dat.datas
    Clear_Record Dat.machine
    Clear_Record Dat.performance

    Dat.job.Recordset.MoveFirst
    Dat.process.Recordset.MoveLast
    Dat.process.Recordset.MoveFirst
    Dat.machine.Recordset.AddNew
    Dat.machine.Recordset("machine_name") = Dat.process.Recordset("machine_name")
    Dat.machine.Recordset("free_time") = 0
    Dat.machine.Recordset("b_start") = 0
    Dat.machine.Recordset("b_stop") = 0
    Dat.machine.Recordset("replace") = 0
    Dat.machine.Recordset.Update
    Dat.performance.Recordset.AddNew
    Dat.performance.Recordset.Update
    Dat.job.Recordset.MoveNext
    First = 32700
    PCtime = 0
    Dat.job.Recordset.MoveFirst
    For i = 1 To Dat.process.Recordset.RecordCount
        Dat.datas.Recordset.AddNew
        If Dat.process.Recordset("job_number") <> First Then
            Dat.datas.Recordset("begin_time") = 0
            First = Dat.process.Recordset("job_number")
            j = 1
            If (i > 1) And (Dat.job.Recordset.AbsolutePosition < Dat.job.Recordset.RecordCount - 1) Then
                Dat.job.Recordset.MoveNext
                Dat.performance.Recordset.MoveLast
                Dat.performance.Recordset.Edit
                Dat.performance.Recordset("processing_time") = PCtime
                Dat.performance.Recordset.Update
                Dat.performance.Recordset.AddNew
                Dat.performance.Recordset.Update
                PCtime = 0
            End If
        Else
            Dat.datas.Recordset("begin_time") = 32700
        End If
        PCtime = PCtime + Dat.process.Recordset("processing_time")
        Dat.datas.Recordset("process_id") = Str(Dat.job.Recordset.AbsolutePosition + 1) & "-" & Right(Str(j),
Len(Str(j) - 1))
        j = j + 1
        temp = "machine_name = '" & Dat.process.Recordset("machine_name") & "'"
        Dat.machine.Recordset.FindFirst temp
        If Dat.machine.Recordset.NoMatch Then
            Dat.machine.Recordset.AddNew
```

```
            Dat.machine.Recordset("machine_name") = Dat.process.Recordset("machine_name")
            Dat.machine.Recordset("free_time") = 0
            Dat.machine.Recordset("b_start") = 0
            Dat.machine.Recordset("b_stop") = 0
            Dat.machine.Recordset("replace") = 0
            Dat.machine.Recordset.Update
            Dat.machine.Recordset.MoveLast
        End If
        Dat.datas.Recordset("machine_number") = Dat.machine.Recordset.AbsolutePositior
        Dat.datas.Recordset("start") = 0
        Dat.datas.Recordset("end") = 0
        Dat.datas.Recordset.Update
        Dat.performance.Recordset.MoveLast
        Dat.performance.Recordset.Edit
        Dat.performance.Recordset("processing_time") = PCtime
        Dat.performance.Recordset.Update
        Dat.process.Recordset.MoveNext
    Next i
End Sub

Sub Reset()
    Bar.Cls
    SetValue 0
End Sub
```

```
VERSION 4.00
Begin VB.Form Job_Table
   Caption         =   "Job Table"
   ClientHeight    =   4515
   ClientLeft      =   1170
   ClientTop       =   2340
   ClientWidth     =   7650
   Height          =   4920
   Left            =   1110
   LinkTopic       =   "Form1"
   ScaleHeight     =   4515
   ScaleWidth      =   7650
   Top             =   1995
   Width           =   7770
   Begin VB.CommandButton Quit
      Caption         =   "&Close"
      BeginProperty Font
         name            =   "MS Sans Serif"
         charset         =   222
         weight          =   700
         size            =   8.25
         underline       =   0   'False
         italic          =   0   'False
         strikethrough   =   0   'False
      EndProperty
      Height          =   375
      Left            =   2760
      TabIndex        =   1
      Top             =   4080
      Width           =   1215
   End
   Begin VB.Label Label6
      AutoSize        =   -1  'True
      BackColor       =   &H00808080&
      BorderStyle     =   1  'Fixed Single
      Caption         =   "No."
      BeginProperty Font
         name            =   "MS Sans Serif"
         charset         =   222
         weight          =   700
         size            =   8.25
         underline       =   0   'False
         italic          =   0   'False
         strikethrough   =   0   'False
      EndProperty
      Height          =   255
      Left            =   120
      TabIndex        =   8
      Top             =   120
      Width           =   360
   End
   Begin VB.Label Label2
      Alignment       =   2  'Center
      BackColor       =   &H00808080&
      BorderStyle     =   1  'Fixed Single
```

```
    Caption         =  "Operation Name"
    BeginProperty Font
      name          =  "MS Sans Serif"
      charset       =  222
      weight        =  700
      size          =  8.25
      underline     =  0   'False
      italic        =  0   'False
      strikethrough =  0   'False
    EndProperty
    Height          =  255
    Left            =  1440
    TabIndex        =  7
    Top             =  120
    Width           =  1455
  End
  Begin VB.Label Label3
    Alignment       =  2  'Center
    BackColor       =  &H00808080&
    BorderStyle     =  1  'Fixed Single
    Caption         =  "Machine Name"
    BeginProperty Font
      name          =  "MS Sans Serif"
      charset       =  222
      weight        =  700
      size          =  8.25
      underline     =  0   'False
      italic        =  0   'False
      strikethrough =  0   'False
    EndProperty
    Height          =  255
    Left            =  2880
    TabIndex        =  6
    Top             =  120
    Width           =  1335
  End
  Begin VB.Label Label1
    Alignment       =  2  'Center
    BackColor       =  &H00808080&
    BorderStyle     =  1  'Fixed Single
    Caption         =  "Job Name"
    BeginProperty Font
      name          =  "MS Sans Serif"
      charset       =  222
      weight        =  700
      size          =  8.25
      underline     =  0   'False
      italic        =  0   'False
      strikethrough =  0   'False
    EndProperty
    Height          =  255
    Left            =  480
    TabIndex        =  5
    Top             =  120
    Width           =  975
```

```
End
Begin VB.Label Label5
   Alignment      =  2  'Center
   BackColor      =  &H008080808&
   BorderStyle    =  1  'Fixed Single
   Caption        =  "Due Date"
   BeginProperty Font
      name           =  "MS Sans Serif"
      charset        =  222
      weight         =  700
      size           =  8.25
      underline      =  0   'False
      italic         =  0   'False
      strikethrough  =  0   'False
   EndProperty
   Height         =  255
   Left           =  5640
   TabIndex       =  4
   Top            =  120
   Width          =  1095
End
Begin VB.Label Label4
   Alignment      =  2  'Center
   BackColor      =  &H008080808&
   BorderStyle    =  1  'Fixed Single
   Caption        =  "Processing Time:"
   BeginProperty Font
      name           =  "MS Sans Serif"
      charset        =  222
      weight         =  700
      size           =  8.25
      underline      =  0   'False
      italic         =  0   'False
      strikethrough  =  0   'False
   EndProperty
   Height         =  255
   Left           =  4200
   TabIndex       =  3
   Top            =  120
   Width          =  1470
End
Begin MSGrid.Grid Table
   Height         =  1335
   Left           =  240
   TabIndex       =  0
   Top            =  600
   Width          =  4815
   _Version       =  65536
   _ExtentX       =  8493
   _ExtentY       =  2355
   _StockProps    =  77
   BackColor      =  16777215
   BeginProperty Font {0BE35203-8F91-11CE-9DE3-00AA004BB851}
      name           =  "MS Sans Serif"
      charset        =  222
```

```
      weight         =  700
      size           =  8.25
      underline      =  0   'False
      italic         =  0   'False
      strikethrough  =  0   'False
    EndProperty
    BorderStyle    =  0
    Rows           =  1
    Cols           =  6
    FixedRows      =  0
    FixedCols      =  0
    ScrollBars     =  2
  End
  Begin VB.Label Border
    BorderStyle    =  1   'Fixed Single
    BeginProperty Font
      name           =  "MS Sans Serif"
      charset        =  222
      weight         =  700
      size           =  8.25
      underline      =  0   'False
      italic         =  0   'False
      strikethrough  =  0   'False
    EndProperty
    Height         =  2655
    Left           =  120
    TabIndex       =  2
    Top            =  480
    Width          =  6255
  End
End
Attribute VB_Name = "Job_Table"
Attribute VB_Creatable = False
Attribute VB_Exposed = False
Public first_in As Boolean

Sub Arrange_form()
   Border.Left = 90
   Border.Top = 300
   Border.Width = Job_Table.Width - 320
   Border.Height = Job_Table.Height - 1200
   Table.Left = Border.Left + 40
   Table.Top = Border.Top + 40
   Table.Width = Border.Width - 80
   Table.Height = Border.Height - 80
   Quit.Left = Int((Job_Table.Width - Quit.Width) / 2)
   Quit.Top = Job_Table.Height - 820
   If Table.Height > (Table.RowHeight(0) + 15) * Table.Rows Then
      Label6.Top = 10
      Label6.Width = 500
      label6left = 100
      Label5.Top = 10
      Label5.Width = 1000
      Label5.Left = Job_Table.Width - 1230
      Label4.Top = 10
```

```
        Label4.Width = 1500
        Label4.Left = Label5.Left - 1520
        temp = Int((Label4.Left - 1000) / 3)
        Label3.Top = 10
        Label3.Width = temp
        Label3.Left = Label4.Left - temp - 20
        temp = Int((Label3.Left - 1000) / 2)
        Label2.Top = 10
        Label2.Width = temp
        Label2.Left = Label3.Left - temp - 20
        Label1.Top = 10
        Label1.Width = Label2.Left - 630
        Label1.Left = 610
    Else
        Label6.Top = 10
        Label6.Width = 500
        label6left = 100
        Label5.Top = 10
        Label5.Width = 1000
        Label5.Left = Job_Table.Width - 1480
        Label4.Top = 10
        Label4.Width = 1500
        Label4.Left = Label5.Left - 1520
        temp = Int((Label4.Left - 1000) / 3)
        Label3.Top = 10
        Label3.Width = temp
        Label3.Left = Label4.Left - temp - 20
        temp = Int((Label3.Left - 1000) / 2)
        Label2.Top = 10
        Label2.Width = temp
        Label2.Left = Label3.Left - temp - 20
        Label1.Top = 10
        Label1.Width = Label2.Left - 630
        Label1.Left = 610
    End If
    Table.ColWidth(0) = Label6.Width - 30
    Table.ColWidth(1) = Label1.Width
    Table.ColWidth(2) = Label2.Width
    Table.ColWidth(3) = Label3.Width
    Table.ColWidth(4) = Label4.Width
    Table.ColWidth(5) = Label5.Width - 20
End Sub

Sub Fill_Table()
    Dim NJob As Integer

    NJob = 32700
    Table.ColAlignment(0) = 1
    Table.ColAlignment(1) = 0
    Table.ColAlignment(2) = 0
    Table.ColAlignment(3) = 0
    Table.ColAlignment(4) = 1
    Table.ColAlignment(5) = 1
    Dat.job.Recordset.MoveLast
```

```
    Dat.process.Recordset.MoveLast
    Dat.job.Recordset.MoveFirst
    Dat.process.Recordset.MoveFirst
    Table.Rows = Dat.process.Recordset.RecordCount
    For i = 0 To Dat.process.Recordset.RecordCount - 1
        Dat.process.Recordset.AbsolutePosition = i
        Table.Row = i
        If Dat.process.Recordset("job_number") <> NJob Then
            NJob = Dat.process.Recordset("job_number")
            If i <> 0 Then Dat.job.Recordset.MoveNext
            Table.Col = 0
            Table.Text = Dat.job.Recordset.AbsolutePosition + 1
            Table.Col = 1
            Table.Text = Dat.job.Recordset("job_name")
        Else
            Table.Col = 0
            Table.Text = ""
            Table.Col = 1
            Table.Text = ""
        End If
        Table.Col = 2
        Table.Text = Dat.process.Recordset("process_name")
        Table.Col = 3
        Table.Text = Dat.process.Recordset("machine_name")
        Table.Col = 4
        Table.Text = Format(Dat.process.Recordset("processing_time"), "#,##0.00"
        Table.Col = 5
        Table.Text = Dat.job.Recordset("due_date")
    Next i
End Sub
Private Sub Form_Activate()
    Arrange_form
End Sub
Private Sub Form_Resize()
    If Job_Table.WindowState <> 1 Then
        If Job_Table.Width < 9000 Then Job_Table.Width = 9000
        If Job_Table.Height < 4000 Then Job_Table.Height = 4000
        Arrange_form
    End If
End Sub
Private Sub Form_Unload(Cancel As Integer)
    Job_Table.Enabled = False
    Job_Table.Visible = False
    Unload Job_Table
    Main.Enabled = True
    Main.Visible = True
End Sub
Private Sub Quit_Click()
    Job_Table.Enabled = False
    Job_Table.Visible = False
    Unload Job_Table
    Main.Enabled = True
    Main.Visible = True
End Sub
```

```
VERSION 4.00
Begin VB.Form Job_Table
   Caption        =  "Job Table"
   ClientHeight   =  4515
   ClientLeft     =  1725
   ClientTop      =  1500
   ClientWidth    =  6330
   Height         =  4920
   Left           =  1665
   LinkTopic      =  "Form1"
   ScaleHeight    =  4515
   ScaleWidth     =  6330
   Top            =  1155
   Width          =  6450
   Begin VB.CommandButton Quit
      Caption        =  "&Exit"
      BeginProperty Font
         name           =  "AngsanaUPC"
         charset        =  222
         weight         =  700
         size           =  14.25
         underline      =  0   'False
         italic         =  0   'False
         strikethrough  =  0   'False
      EndProperty
      Height         =  435
      Left           =  5400
      TabIndex       =  1
      Top            =  3960
      Width          =  855
   End
   Begin VB.Data Job
      Caption        =  "Data1"
      Connect        =  "Access"
      DatabaseName   =  "DATA.MDB"
      Exclusive      =  0   'False
      BeginProperty Font
         name           =  "AngsanaUPC"
         charset        =  222
         weight         =  700
         size           =  14.25
         underline      =  0   'False
         italic         =  0   'False
         strikethrough  =  0   'False
      EndProperty
      Height         =  510
      Left           =  120
      Options        =  0
      ReadOnly       =  0   'False
      RecordsetType  =  1   'Dynaset
      RecordSource   =  "Job"
      Top            =  3960
      Visible        =  0   'False
      Width          =  1140
End
```

```
Begin VB.Data Process
   Caption         =  "Data2"
   Connect         =  "Access"
   DatabaseName    =  "DATA.MDB"
   Exclusive       =  0  'False
   BeginProperty Font
      name         =  "AngsanaUPC"
      charset      =  222
      weight       =  700
      size         =  14.25
      underline    =  0  'False
      italic       =  0  'False
      strikethrough  =  0  'False
   EndProperty
   Height          =  510
   Left            =  1200
   Options         =  0
   ReadOnly        =  0  'False
   RecordsetType   =  1  'Dynaset
   RecordSource    =  "Process"
   Top             =  3960
   Visible         =  0  'False
   Width           =  1140
End
Begin VB.Label Label2
   Alignment       =  2  'Center
   BackColor       =  &H00808080&
   BorderStyle     =  1  'Fixed Single
   Caption         =  "Operation Name"
   BeginProperty Font
      name         =  "AngsanaUPC"
      charset      =  222
      weight       =  700
      size         =  14.25
      underline    =  0  'False
      italic       =  0  'False
      strikethrough  =  0  'False
   EndProperty
   Height          =  435
   Left            =  960
   TabIndex        =  7
   Top             =  0
   Width           =  1455
End
Begin VB.Label Label3
   Alignment       =  2  'Center
   BackColor       =  &H00808080&
   BorderStyle     =  1  'Fixed Single
   Caption         =  "Machine Name"
   BeginProperty Font
      name         =  "AngsanaUPC"
      charset      =  222
      weight       =  700
      size         =  14.25
      underline    =  0  'False
```

```
    italic          =  0   'False
    strikethrough   =  0   'False
  EndProperty
  Height          =  435
  Left            =  2400
  TabIndex        =  6
  Top             =  0
  Width           =  1335
End
Begin VB.Label Label1
  Alignment       =  2  'Center
  BackColor       =  &H00808080&
  BorderStyle     =  1  'Fixed Single
  Caption         =  "Job Name"
  BeginProperty Font
    name          =  "AngsanaUPC"
    charset       =  222
    weight        =  700
    size          =  14.25
    underline     =  0   'False
    italic        =  0   'False
    strikethrough =  0   'False
  EndProperty
  Height          =  435
  Left            =  0
  TabIndex        =  5
  Top             =  0
  Width           =  975
End
Begin VB.Label Label5
  Alignment       =  2  'Center
  BackColor       =  &H00808080&
  BorderStyle     =  1  'Fixed Single
  Caption         =  "Due Date"
  BeginProperty Font
    name          =  "AngsanaUPC"
    charset       =  222
    weight        =  700
    size          =  14.25
    underline     =  0   'False
    italic        =  0   'False
    strikethrough =  0   'False
  EndProperty
  Height          =  435
  Left            =  5160
  TabIndex        =  4
  Top             =  0
  Width           =  1095
End
Begin VB.Label Label4
  Alignment       =  2  'Center
  BackColor       =  &H00808080&
  BorderStyle     =  1  'Fixed Single
  Caption         =  "Processing Time"
  BeginProperty Font
```

```
      name           =  "AngsanaUPC"
      charset        =  222
      weight         =  700
      size           =  14.25
      underline      =  0   'False
      italic         =  0   'False
      strikethrough  =  0   'False
    EndProperty
    Height           =  435
    Left             =  3720
    TabIndex         =  3
    Top              =  0
    Width            =  1470
  End
  Begin MSGrid.Grid Table
    Height           =  1335
    Left             =  240
    TabIndex         =  0
    Top              =  1080
    Width            =  5775
    _Version         =  65536
    _ExtentX         =  10186
    _ExtentY         =  2355
    _StockProps      =  77
    BackColor        =  16777215
    BeginProperty Font {0BE35203-8F91-11CE-9DE3-00AA004BB851}
      name           =  "AngsanaUPC"
      charset        =  222
      weight         =  700
      size           =  14.25
      underline      =  0   'False
      italic         =  0   'False
      strikethrough  =  0   'False
    EndProperty
    BorderStyle      =  0
    Rows             =  1
    Cols             =  5
    FixedRows        =  0
    FixedCols        =  0
    ScrollBars       =  2
  End
  Begin VB.Label Border
    BorderStyle      =  1   'Fixed Single
    Height           =  2655
    Left             =  120
    TabIndex         =  2
    Top              =  480
    Width            =  6135
  End
End
Attribute VB_Name = "Job_Table"
Attribute VB_Creatable = False
Attribute VB_Exposed = False
Public first_in As Boolean
```

```
Sub Arrange_Form()
    Border.Left = 50
    Border.Top = 500
    Border.Width = Job_Table.Width - 210
    Border.Height = Job_Table.Height - 1500
    Table.Left = 100
    Table.Top = 550
    Table.Width = Border.Width - 130
    Table.Height = Border.Height - 130
    Quit.Left = Job_Table.Width - 1100
    Quit.Top = Job_Table.Height - 900
    If Table.Height > (Table.RowHeight(0) + 15) * Table.Rows Then
        Label5.Top = 10
        Label5.Width = 1000
        Label5.Left = Job_Table.Width - 1230
        Label4.Top = 10
        Label4.Width = 1500
        Label4.Left = Label5.Left - 1520
        Temp = (Label4.Left - 160) \ 3
        Label3.Top = 10
        Label3.Width = Temp
        Label3.Left = Label4.Left - Temp - 20
        Temp = (Label3.Left - 140) \ 2
        Label2.Top = 10
        Label2.Width = Temp
        Label2.Left = Label3.Left - Temp - 20
        Label1.Top = 10
        Label1.Width = Label2.Left - 120
        Label1.Left = 100
        Table.ColWidth(0) = Label1.Width
        Table.ColWidth(1) = Label2.Width
        Table.ColWidth(2) = Label3.Width
        Table.ColWidth(3) = Label4.Width
        Table.ColWidth(4) = Label5.Width - 10
    Else
        Label5.Top = 10
        Label5.Width = 1000
        Label5.Left = Job_Table.Width - 1480
        Label4.Top = 10
        Label4.Width = 1500
        Label4.Left = Label5.Left - 1520
        Temp = (Label4.Left - 160) \ 3
        Label3.Top = 10
        Label3.Width = Temp
        Label3.Left = Label4.Left - Temp - 20
        Temp = (Label3.Left - 140) \ 2
        Label2.Top = 10
        Label2.Width = Temp
        Label2.Left = Label3.Left - Temp - 20
        Label1.Top = 10
        Label1.Width = Label2.Left - 120
        Label1.Left = 100
        Table.ColWidth(0) = Label1.Width
        Table.ColWidth(1) = Label2.Width
        Table.ColWidth(2) = Label3.Width
```

```
        Table.ColWidth(3) = Label4.Width
        Table.ColWidth(4) = Label5.Width - 10
    End If
End Sub


Sub Fill_Table()
    Dim NJob As Integer

    NJob = 32700
    Job.Recordset.MoveLast
    Process.Recordset.MoveLast
    Job.Recordset.MoveFirst
    Process.Recordset.MoveFirst
    Table.Rows = Process.Recordset.RecordCount
    For i = 0 To Process.Recordset.RecordCount - 1
        Table.Row = i
        If Process.Recordset("job_number") <> NJob Then
            NJob = Process.Recordset("job_number")
            If i <> 0 Then Job.Recordset.MoveNext
            Table.Col = 0
            Table.Text = Job.Recordset("job_name")
        Else
            Table.Col = 0
            Table.Text = ""
        End If
        Table.Col = 1
        Table.Text = Process.Recordset("process_name")
        Table.Col = 2
        Table.Text = Process.Recordset("machine_name")
        Table.Col = 3
        Table.Text = Process.Recordset("processing_time")
        Table.Col = 4
        Table.Text = Job.Recordset("due_date")
        Process.Recordset.MoveNext
    Next i
End Sub


Private Sub Form_Activate()
    If first_in Then
        first_in = False
        Fill_Table
        Arrange_Form
    End If
End Sub

Private Sub Form_Resize()
    If Job_Table.WindowState <> 1 Then
        If Job_Table.Width < 7500 Then Job_Table.Width = 7500
        If Job_Table.Height < 5000 Then Job_Table.Height = 5000
        Arrange_Form
    End If
End Sub
```

```
Private Sub Form_Unload(Cancel As Integer)
    Job_Table.Enabled = False
    Job_Table.Visible = False
    Unload Chart
    Main.Enabled = True
    Main.Visible = True
End Sub


Private Sub Quit_Click()
    Job_Table.Enabled = False
    Job_Table.Visible = False
    Unload Job_Table
    Main.Enabled = True
    Main.Visible = True
End Sub
```

```
VERSION 4.00
Begin VB.Form JobChart
   AutoRedraw      =  -1  'True
   Caption         =  "Scheduling Job Chart"
   ClientHeight    =  5130
   ClientLeft      =  1395
   ClientTop       =  1935
   ClientWidth     =  7080
   BeginProperty Font
      name            =  "Courier"
      charset         =  0
      weight          =  700
      size            =  9.75
      underline       =  0   'False
      italic          =  0   'False
      strikethrough   =  0   'False
   EndProperty
   Height          =  5535
   Left            =  1335
   LinkTopic       =  "Form1"
   ScaleHeight     =  5130
   ScaleWidth      =  7080
   Top             =  1590
   Width           =  7200
   Begin VB.CommandButton Obj
      BeginProperty Font
         name            =  "MS Sans Serif"
         charset         =  222
         weight          =  700
         size            =  8.25
         underline       =  0   'False
         italic          =  0   'False
         strikethrough   =  0   'False
      EndProperty
      Height          =  375
      Left            =  2520
      TabIndex        =  2
      Top             =  1320
      Visible         =  0   'False
      Width           =  855
   End
   Begin VB.PictureBox Number
      AutoRedraw      =  -1  'True
      Height          =  3855
      Left            =  120
      ScaleHeight     =  3795
      ScaleWidth      =  435
      TabIndex        =  7
      Top             =  360
      Width           =  495
   End
   Begin VB.PictureBox Scale_X
      AutoRedraw      =  -1  'True
      Height          =  255
      Left            =  720
```

```
  ScaleHeight    =  195
  ScaleWidth     =  5835
  TabIndex       =  6
  Top            =  0
  Width          =  5895
End
Begin VB.VScrollBar Scroll_Y
  Height         =  3855
  Left           =  6720
  TabIndex       =  5
  Top            =  360
  Visible        =  0   'False
  Width          =  255
End
Begin VB.HScrollBar Scroll_X
  Height         =  255
  Left           =  720
  TabIndex       =  4
  Top            =  4080
  Visible        =  0   'False
  Width          =  5895
End
Begin VB.ComboBox Zoom
  BeginProperty Font
    name         =  "MS Sans Serif"
    charset      =  222
    weight       =  700
    size         =  8.25
    underline    =  0   'False
    italic       =  0   'False
    strikethrough =  0   'False
  EndProperty
  Height         =  315
  ItemData       =  "JobChart.frx":0000
  Left           =  720
  List           =  "JobChart.frx":0010
  TabIndex       =  3
  Text           =  "Over View"
  Top            =  4560
  Width          =  1455
End
Begin VB.CommandButton Quit
  Caption        =  "&Close"
  BeginProperty Font
    name         =  "MS Sans Serif"
    charset      =  222
    weight       =  700
    size         =  8.25
    underline    =  0   'False
    italic       =  0   'False
    strikethrough =  0   'False
  EndProperty
  Height         =  405
  Left           =  3120
  TabIndex       =  1
```

```
    Top             =   4440
    Width           =   1215
  End
  Begin VB.PictureBox Graph
    AutoRedraw      =   -1  'True
    BeginProperty Font
      name          =   "MS Sans Serif"
      charset       =   222
      weight        =   700
      size          =   8.25
      underline     =   0   'False
      italic        =   0   'False
      strikethrough =   0   'False
    EndProperty
    Height          =   3630
    Left            =   840
    ScaleHeight     =   3570
    ScaleWidth      =   5625
    TabIndex        =   0
    Top             =   360
    Width           =   5685
  End
  Begin VB.Label Label1
    AutoSize        =   -1  'True
    Caption         =   "Zoom"
    BeginProperty Font
      name          =   "MS Sans Serif"
      charset       =   222
      weight        =   700
      size          =   8.25
      underline     =   0   'False
      italic        =   0   'False
      strikethrough =   0   'False
    EndProperty
    Height          =   195
    Left            =   120
    TabIndex        =   8
    Top             =   4680
    Width           =   465
  End
End
Attribute VB_Name = "JobChart"
Attribute VB_Creatable = False
Attribute VB_Exposed = False
Dim X_size, Y_size As Long
Dim Begin_X, Begin_Y As Long
Dim Oper_Point, Least As Integer
Dim Old_Y As Long
Dim first_in As Boolean
Sub Arrange_form()
  Scroll_X.Height = 250
  Scroll_Y.Width = 250
  Label1.Left = 100
  Label1.Top = JobChart.Height - 700
  Zoom.Left = Label1.Left + Label1.Width + 120
```

```
Zoom.Top = Label1.Top - 100
scale_x.Height = 250
scale_x.Top = 100
Number.Left = 100
Number.Width = 400
scale_x.Left = Number.Left + Number.Width + 50
Number.Top = scale_x.Top + scale_x.Height + 50
Graph.Left = scale_x.Left
Graph.Top = Number.Top
Quit.Left = Int((JobChart.Width - Quit.Width) / 2)
Quit.Top = JobChart.Height - 900
scale_x.Width = JobChart.Width - Graph.Left - 200
Number.Height = Quit.Top - Graph.Top - 200
X_size = Int((Graph.Width - 70) / Max_Time)
Y_size = Int((Graph.Height - 60) / Dat.job.Recordset.RecordCount)
Select Case Zoom.ListIndex
Case 0 'Over View
   Begin_X = 0
   Begin_Y = 0
   Scroll_X.Visible = False
   Scroll_Y.Visible = False
Case 1 '200%
   If (X_size < 300) Or (Y_size < 1000) Then
      If Y_size < 1000 Then scale_x.Width = scale_x.Width - 350
      If X_size < 300 Then Number.Height = Number.Height - 350
      If Y_size < 1000 Then
         Y_size = Int((Number.Height - 60) / CInt(Dat.job.Recordset.RecordCount / 2 + 0.005))
         Scroll_Y.Visible = True
         Scroll_Y.Max = Dat.job.Recordset.RecordCount - CInt(Dat.job.Recordset.RecordCount / 2 + 0.005
         Scroll_Y.LargeChange = CInt(Scroll_Y.Max * 0.11) + 1
         If Begin_Y > Scroll_Y.Max Then
            Begin_Y = Scroll_Y.Max
         End If
      Else
         Y_size = Int((Number.Height - 60) / Dat.job.Recordset.RecordCount
         Begin_Y = 0
         Scroll_Y.Visible = False
      End If
      If X_size < 300 Then
         X_size = Int(2 * (scale_x.Width - 70) / (Max_Time))
         Scroll_X.Visible = True
         Scroll_X.Max = Max_Time - Int(scale_x.Width / X_size)
         Scroll_X.LargeChange = CInt(Scroll_X.Max * 0.11) + 1
      Else
         X_size = Int((scale_x.Width - 70) / (Max_Time))
         Begin_X = 0
         Scroll_X.Visible = False
      End If
      Scroll_X.Top = Number.Top + Number.Height + 100
      Scroll_Y.Left = scale_x.Left + scale_x.Width + 100
   Else
      Scroll_X.Visible = False
      Scroll_Y.Visible = False
   End If
Case 2 '400%
```

```
    If (X_size < 300) Or (Y_size < 1000) Then
        If Y_size < 1000 Then scale_x.Width = scale_x.Width - 350
        If X_size < 300 Then Number.Height = Number.Height - 350
        If Y_size < 1000 Then
            Y_size = Int((Number.Height - 60) / CInt(Dat.job.Recordset.RecordCount / 4 + 0.5))
            Scroll_Y.Visible = True
            Scroll_Y.Max = Dat.job.Recordset.RecordCount - CInt(Dat.job.Recordset.RecordCount / 4 + 0.5)
            Scroll_Y.LargeChange = CInt(Scroll_Y.Max * 0.11) + 1
            If Begin_Y > Scroll_Y.Max Then
                Begin_Y = Scroll_Y.Max
            End If
        Else
            Y_size = Int((Number.Height - 60) / Dat.job.Recordset.RecordCount)
            Begin_Y = 0
            Scroll_Y.Visible = False
        End If
        If X_size < 300 Then
            X_size = Int(4 * (scale_x.Width - 70) / (Max_Time))
            Scroll_X.Visible = True
            Scroll_X.Max = Max_Time - Int(scale_x.Width / X_size)
            Scroll_X.LargeChange = CInt(Scroll_X.Max * 0.11) + 1
        Else
            X_size = Int((scale_x.Width - 70) / (Max_Time))
            Begin_X = 0
            Scroll_X.Visible = False
        End If
        Scroll_X.Top = Number.Top + Number.Height + 100
        Scroll_Y.Left = scale_x.Left + scale_x.Width + 100
    Else
        Scroll_X.Visible = False
        Scroll_Y.Visible = False
    End If
Case 3 'Detail View
    If (X_size < 300) Or (Y_size < 1000) Then
        If Y_size < 1000 Then scale_x.Width = scale_x.Width - 350
        If X_size < 300 Then Number.Height = Number.Height - 350
        If Y_size < 1000 Then
            temp = Int((Number.Height - 60) / 1000)
            Y_size = Int((Number.Height - 60) / temp)
            Scroll_Y.Visible = True
            Scroll_Y.Max = Dat.job.Recordset.RecordCount - temp
            Scroll_Y.LargeChange = CInt(Scroll_Y.Max * 0.11) + 1
            If Begin_Y > Scroll_Y.Max Then
                Begin_Y = Scroll_Y.Max
            End If
        Else
            Y_size = Int((Number.Height - 60) / Dat.job.Recordset.RecordCount)
            Begin_Y = 0
            Scroll_Y.Visible = False
        End If
        If X_size < 300 Then
            X_size = 300
            Scroll_X.Visible = True
            Scroll_X.Max = Max_Time - Int(scale_x.Width / X_size)
            Scroll_X.LargeChange = CInt(Scroll_X.Max * 0.11) + 1
```

```
            Else
               X_size = Int((scale_x.Width - 70) / (Max_Time))
               Begin_X = 0
               Scroll_X.Visible = False
            End If
            Scroll_X.Top = Number.Top + Number.Height + 100
            Scroll_Y.Left = scale_x.Left + scale_x.Width + 100
         Else
            Scroll_X.Visible = False
            Scroll_Y.Visible = False
         End If
      End Select
      Graph.Width = scale_x.Width
      Graph.Height = Number.Height
      Scroll_X.Left = Graph.Left
      Scroll_X.Width = Graph.Width
      Scroll_Y.Top = Graph.Top
      Scroll_Y.Height = Graph.Height
      Output
   End Sub
   Sub Out_Box(bx, by, bwidth, bheight As Long, boolor As Long, Dat As String
      Graph.CurrentX = bx
      Graph.CurrentY = by + 30
      Graph.Line Step(0, 0)-Step(bwidth, bheight - 60), boolor, BF
      Graph.Line Step(0, 0)-Step(-bwidth, 0), QBColor(0), BF
      Graph.Line Step(0, 0)-Step(0, -bheight + 60), QBColor(15), BF
      Graph.Line Step(0, 0)-Step(bwidth, 0), QBColor(15), BF
      Graph.Line Step(0, 0)-Step(0, bheight - 60), QBColor(0), BF
      Graph.CurrentX = bx + Int((bwidth - (Len(Dat) * 100)) / 2)
      Graph.CurrentY = by + Int((bheight - 180) / 2)
      If Graph.CurrentX > bx Then
         Graph.Print Dat
      End If
   End Sub
   Sub Out_LBox(bx, by, bwidth, bheight As Long, boolor As Long, Dat As String)
      Graph.CurrentX = bx
      Graph.CurrentY = by + 30
      Graph.Line Step(0, 0)-Step(bwidth, bheight - 60), boolor, BF
      Graph.Line Step(0, 0)-Step(-bwidth, 0), QBColor(12), BF
      Graph.Line Step(0, 0)-Step(0, -bheight + 60), QBColor(15), BF
      Graph.Line Step(0, 0)-Step(bwidth, 0), QBColor(15), BF
      Graph.Line Step(0, 0)-Step(0, bheight - 60), QBColor(12), BF
      Graph.CurrentX = bx + Int((bwidth - (Len(Dat) * 100)) / 2)
      Graph.CurrentY = by + Int((bheight - 180) / 2)
      If Graph.CurrentX > bx Then
         Graph.Print Dat
      End If
   End Sub
   Sub Output()
      Dim pX, pY, pW As Long
      Dim Current, ScaleStep As Integer

      JobChart.Caption = "Scheduling Job Gantt Chart ( " & ChartName & " )"
      Randomize
      Graph.Cls
```

```
Number.Cls
scale_x.Cls
Graph.ForeColor = 0
i = Begin_X
ScaleStep = Int(1100 / X_size)
If ScaleStep = 0 Then ScaleStep = 1
While ((i - Begin_X) * X_size <= scale_x.Width) And (i <= CInt(Max_Time))
   scale_x.CurrentX = (i - Begin_X) * X_size
   scale_x.CurrentY = scale_x.Height
   scale_x.Line Step(0, 0)-Step(0, -200), QBColor(0), BF
   temp = Str(i)
   temp = Right(temp, Len(temp) - 1)
   scale_x.CurrentX = scale_x.CurrentX + 20
   scale_x.CurrentY = 0
   scale_x.Print temp
   i = i + ScaleStep
Wend
i = Begin_Y
While (i < Dat.job.Recordset.RecordCount) And ((i - Begin_Y) * Y_size < Number.Height)
   Number.CurrentX = 40
   Number.CurrentY = (i - Begin_Y) * Y_size + Int(Y_size / 2) - 12
   Number.Print i + 1
   Dat.job.Recordset.AbsolutePosition = i
   Graph.CurrentX = (Dat.job.Recordset("due_date") - Begin_X) * X_size
   Graph.CurrentY = (Dat.job.Recordset.AbsolutePosition - Begin_Y) * Y_siz
   Graph.Line Step(0, 0)-Step(Graph.Width, Y_size), QBColor(8), BF
   i = i + 1
Wend
Dat.process.Recordset.MoveFirst
Dat.job.Recordset.MoveFirst
Current = Dat.process.Recordset("job_number")
For i = 0 To Dat.datas.Recordset.RecordCount - 1
   Dat.datas.Recordset.AbsolutePosition = i
   Dat.process.Recordset.AbsolutePosition = i
   If Current <> Dat.process.Recordset("job_number") Then
      Current = Dat.process.Recordset("job_number")
      Dat.job.Recordset.MoveNext
   End If
   pX = (Dat.datas.Recordset("start") - Begin_X) * X_size
   pY = (Dat.job.Recordset.AbsolutePosition - Begin_Y) * Y_size
   pW = Int((Dat.datas.Recordset("end") - Dat.datas.Recordset("start")) * X_siz
   If Y_size > 0 Then
      If Dat.datas.Recordset("end") <= Dat.job.Recordset("due_date") Then
         If Y_size > 720 Then
            Out_Box pX, pY + Int((Y_size - 720) / 2), pW - 16, 700,
QBColor(Dat.datas.Recordset("machine_number") + 1), Dat.datas.Recordset("Machine_Number") +
         Else
            Out_Box pX, pY, pW - 16, Y_size - 10, QBColor(Dat.datas.Recordset("machine_number") + 1),
Dat.datas.Recordset("machine_number") + 1
         End If
      Else
         If Y_size > 720 Then
            Out_LBox pX, pY + Int((Y_size - 720) / 2), pW - 16, 700,
QBColor(Dat.datas.Recordset("machine_number") + 1), Dat.datas.Recordset("Machine_Number") +
         Else
```

```
                Out_LBox pX, pY, pW - 16, Y_size - 10, QBColor(Dat.datas.Recordset("machine_number") + 1),
Dat.datas.Recordset("machine_number") + 1
            End If
          End If
        End If
    Next i
End Sub

Private Sub Form_Activate()
    Randomize
    If (Max_Time > 0) Then
        Arrange_form
        If first_in Then
            first_in = False
            Zoom.ListIndex = 0
        End If
    Else
        temp = MsgBox("Error! Data not ready", vbOKOnly, "Error")
        JobChart.Enabled = False
        JobChart.Visible = False
        Unload JobChart
        Main.Enabled = True
        Main.Visible = True
    End If
End Sub

Private Sub Form_Resize()
    If Not (first_in) Then
        If JobChart.WindowState <> 1 Then
            If JobChart.Height < (2500 + Dat.job.Recordset.RecordCount * 300) Then
                JobChart.Height = (2500 + Dat.job.Recordset.RecordCount * 30(
            End If
            If JobChart.Width < 6500 Then
                JobChart.Width = 6500
            End If
            Arrange_form
        End If
    End If
End Sub


Private Sub Form_Unload(Cancel As Integer)
    JobChart.Enabled = False
    JobChart.Visible = False
    Unload JobChart
    Main.Enabled = True
    Main.Visible = True
End Sub


Private Sub Graph_MouseDown(Button As Integer, Shift As Integer, X As Single, Y As Singl
    Dim tY, tX As Double
    Dim aY As Integer
    Dim aX As Single
    Dim temp, temp1 As Long
```

```
    Dim found As Boolean
    Dim Message, tKey As String

    Graph.CurrentX = X
    Graph.CurrentY = Y
    If Button > 1 Then
       aY = Int(Graph.CurrentY / Y_size)
       If Y_size > 720 Then
          temp = aY * Y_size + Int((Y_size - 720) / 2)
          temp1 = (aY + 1) * Y_size - Int((Y_size - 720) / 2)
       Else
          temp = aY * Y_size
          temp1 = temp + Y_size
       End If
       If (Graph.CurrentY > temp) And (Graph.CurrentY < temp1) Then
          aY = aY + Begin_Y
          Dat.job.Recordset.AbsolutePosition = aY
          temp = Dat.job.Recordset("job_number")
          aX = Graph.CurrentX / X_size + Begin_X
          Dat.datas.Recordset.MoveFirst
          Dat.process.Recordset.MoveFirst
          found = False
          Do
             If (Dat.datas.Recordset("start") < aX) And (aX < Dat.datas.Recordset("end")) And
(Dat.process.Recordset("job_number") = temp) Then
                found = True
                Exit Do
             Else
                If (Dat.datas.Recordset.AbsolutePosition >= Dat.datas.Recordset.RecordCount - 1) Then
                   Exit Do
                End If
             End If
             Dat.datas.Recordset.MoveNext
             Dat.process.Recordset.MoveNext
          Loop Until (found)
          If found Then
             Dat.process.Recordset.AbsolutePosition = Dat.datas.Recordset.AbsolutePosition
             temp2 = "Job_number = " + Str(Dat.process.Recordset("Job_number"))
             Dat.job.Recordset.FindFirst temp2
             m1 = "Job                " & Dat.job.Recordset("job_name") & Chr(10) & Chr(13)
             m2 = "Opertion           " & Dat.process.Recordset("process_name") & Chr(10) & Chr(13)
             m3 = "Machine            " & Dat.process.Recordset("machine_name") & Chr(10) & Chr(13)
             m4 = "Start              " & Format(Dat.datas.Recordset("start"), "#,##0.00") & Chr(10) &
Chr(13)
             m5 = "End                " & Format(Dat.datas.Recordset("end"), "#,##0.00") & Chr(10) &
Chr(13)
             m6 = "Processing Time    " & Format(Dat.process.Recordset("processing_time"), "#,##0.00") &
Chr(10) & Chr(13)
             Message = m1 & m2 & m3 & m4 & m5 & m6
             temp = MsgBox(Message, vbOKOnly, "Data")
          End If
       End If
    Else
       tY = Int(Graph.CurrentY / Y_size)
       If Y_size > 720 Then
```

```
    temp = tY * Y_size + Int((Y_size - 720) / 2)
    temp1 = (tY + 1) * Y_size - Int((Y_size - 720) / 2)
  Else
    temp = tY * Y_size
    temp1 = temp + Y_size
  End If
  If (Graph.CurrentY > temp) And (Graph.CurrentY < temp1) Then
    tY = tY + Begin_Y
    Dat.job.Recordset.AbsolutePosition = tY
    tKey = "job_number = " + Str(Dat.job.Recordset("job_number"))
    Dat.process.Recordset.FindFirst tKey
    Dat.datas.Recordset.MoveLast
    Dat.datas.Recordset.AbsolutePosition = Dat.process.Recordset.AbsolutePositio
    tX = Graph.CurrentX / X_size + Begin_X
    found = False
    Do
      If (Dat.datas.Recordset("start") < tX) And (tX < Dat.datas.Recordset("end")) The
        found = True
        temp = Dat.process.Recordset("job_number")
        If Dat.process.Recordset.AbsolutePosition > 0 Then
          Dat.process.Recordset.MovePrevious
          If Dat.process.Recordset("job_number") = temp Then
            Dat.datas.Recordset.MovePrevious
            Least = Dat.datas.Recordset("end")
            Dat.datas.Recordset.MoveNext
          Else
            Least = 0
          End If
          Dat.process.Recordset.MoveNext
        Else
          Least = 0
        End If
        Graph.MousePointer = 2
        Oper_Point = Dat.datas.Recordset.AbsolutePosition
        pX = (Dat.datas.Recordset("start") - Begin_X) * X_size
        pY = (Dat.job.Recordset.AbsolutePosition - Begin_Y) * Y_size
        pW = Dat.process.Recordset("processing_time") * X_size
        Obj.Left = Graph.Left + pX + 30
        Old_Y = Obj.Top
        Obj.Top = Graph.Top + pY + Int((Y_size - 720) / 2) + 25
        Obj.Width = pW - 16
        Obj.Height = 720
        Obj.Caption = Dat.datas.Recordset("process_id")
        Obj.Visible = True
        Exit Do
      Else
        If (Dat.datas.Recordset.AbsolutePosition >= Dat.datas.Recordset.RecordCount - 1) Or
(Dat.process.Recordset("job_number") <> Dat.job.Recordset("job_number")) Then
          Exit Do
        End If
      End If
      Dat.process.Recordset.MoveNext
      Dat.datas.Recordset.MoveNext
    Loop Until (found)
  End If
```

```
    End If
End Sub


Private Sub Graph_MouseMove(Button As Integer, Shift As Integer, X As Single, Y As Single
    If Obj.Visible Then
        temp = Int(X / X_size) + Begin_X
        If temp < Least Then
            temp = Least
        ElseIf temp < Begin_X Then
            Scroll_X.Value = Scroll_X.Value - Int(Begin_X - temp)
        End If
        If temp > Max_Time Then
            temp = Max_Time
        ElseIf temp - Begin_X >= Int((Graph.Width - 70) / X_size) Then
            If Scroll_X.Value < Scroll_X.Max Then
                Scroll_X.Value = Scroll_X.Value + temp - Begin_X - Int((Graph.Width - 70) / X_size)
            End If
        End If
        Obj.Left = Graph.Left + 30 + (temp - Begin_X) * X_size
    End If
End Sub


Private Sub Graph_MouseUp(Button As Integer, Shift As Integer, X As Single, Y As Single
    Dim pX As Double
    Dim tX As Integer

    Dat.datas.Recordset.AbsolutePosition = Oper_Point
    tX = Int((Obj.Left - Graph.Left) / X_size) + Begin_X
    If Dat.datas.Recordset("start") <> tX Then
        Beep
        Change_Prepare Oper_Point, tX
        ReArrange Oper_Point, tX
        Gen_Performance
        ScheduleTable.Fill_Table
        Table.Fill_Table
        McTable.Fill_Table
    End If
    Graph.MousePointer = 1
    Obj.Visible = False
    Output
End Sub


Private Sub Number_MouseDown(Button As Integer, Shift As Integer, X As Single, Y As Single)
    Dim aY As Integer
    Dim aX As Single
    Dim Message, tKey As String

    Number.CurrentX = X
    Number.CurrentY = Y
    If Button > 1 Then
        aY = Int(Number.CurrentY / Y_size)
        temp = aY * Y_size
```

```
      temp1 = temp + Y_size
      If (Number.CurrentY > temp) And (Number.CurrentY < temp1) Then
         aY = aY + Begin_Y
         Dat.job.Recordset.AbsolutePosition = aY
         m1 = "Job                          " & Dat.job.Recordset("job_name") & Chr(10) & Chr(13)
         m2 = "Number of Operations         " & Format(Dat.job.Recordset("process"), "#,##0") & Chr(10) &
Chr(13)
         m3 = "Due Date                     " & Format(Dat.job.Recordset("due_date"), "#,##0.00") & Chr(10) &
Chr(13)
         Message = m1 & m2 & m3
         temp = MsgBox(Message, vbOKOnly, "Data")
      End If
   End If
End Sub


Private Sub Quit_Click()
   JobChart.Enabled = False
   JobChart.Visible = False
   Unload JobChart
End Sub


Private Sub Scroll_X_Change()
   Begin_X = Scroll_X.Value
   Output
End Sub

Private Sub Scroll_Y_Change()
   Begin_Y = Scroll_Y.Value
   Output
End Sub

Private Sub Zoom_Click()
   Arrange_form
End Sub
```

```
VERSION 4.00
Begin VB.Form JobTable
   Caption        =  "Scheduling Machine Table"
   ClientHeight   =  5475
   ClientLeft     =  1170
   ClientTop      =  2355
   ClientWidth    =  7845
   Height         =  5880
   Left           =  1110
   LinkTopic      =  "Form1"
   ScaleHeight    =  5475
   ScaleWidth     =  7845
   Top            =  2010
   Width          =  7965
   Begin VB.CommandButton Quit
      Caption        =  "&Close"
      BeginProperty Font
         name           =  "MS Sans Serif"
         charset        =  222
         weight         =  700
         size           =  8.25
         underline      =  0   'False
         italic         =  0   'False
         strikethrough  =  0   'False
      EndProperty
      Height         =  375
      Left           =  2640
      TabIndex       =  0
      Top            =  3960
      Width          =  1215
   End
   Begin VB.Label Label8
      AutoSize       =  -1  'True
      BackColor      =  &H00808080&
      BorderStyle    =  1  'Fixed Single
      Caption        =  "No."
      BeginProperty Font
         name           =  "MS Sans Serif"
         charset        =  222
         weight         =  700
         size           =  8.25
         underline      =  0   'False
         italic         =  0   'False
         strikethrough  =  0   'False
      EndProperty
      Height         =  255
      Left           =  0
      TabIndex       =  8
      Top            =  0
      Width          =  360
   End
   Begin VB.Label Label2
      Alignment      =  2  'Center
      BackColor      =  &H00808080&
      BorderStyle    =  1  'Fixed Single
```

```
  Caption         =  "Job Name"
  BeginProperty Font
    name          =  "MS Sans Serif"
    charset       =  222
    weight        =  700
    size          =  8.25
    underline     =  0   'False
    italic        =  0   'False
    strikethrough =  0   'False
  EndProperty
  Height          =  255
  Left            =  1320
  TabIndex        =  7
  Top             =  0
  Width           =  1455
End
Begin VB.Label Label3
  Alignment       =  2  'Center
  BackColor       =  &H00808080&
  BorderStyle     =  1  'Fixed Single
  Caption         =  "Operation Name"
  BeginProperty Font
    name          =  "MS Sans Serif"
    charset       =  222
    weight        =  700
    size          =  8.25
    underline     =  0   'False
    italic        =  0   'False
    strikethrough =  0   'False
  EndProperty
  Height          =  255
  Left            =  2760
  TabIndex        =  6
  Top             =  0
  Width           =  1335
End
Begin VB.Label Label1
  Alignment       =  2  'Center
  BackColor       =  &H00808080&
  BorderStyle     =  1  'Fixed Single
  Caption         =  "Machine Name"
  BeginProperty Font
    name          =  "MS Sans Serif"
    charset       =  222
    weight        =  700
    size          =  8.25
    underline     =  0   'False
    italic        =  0   'False
    strikethrough =  0   'False
  EndProperty
  Height          =  255
  Left            =  360
  TabIndex        =  5
  Top             =  0
  Width           =  975
```

```
End
Begin VB.Label Label5
   Alignment      =  2  'Center
   BackColor      =  &H00808080&
   BorderStyle    =  1  'Fixed Single
   Caption        =  "Ending time"
   BeginProperty Font
      name           =  "MS Sans Serif"
      charset        =  222
      weight         =  700
      size           =  8.25
      underline      =  0   'False
      italic         =  0   'False
      strikethrough  =  0   'False
   EndProperty
   Height         =  255
   Left           =  5520
   TabIndex       =  4
   Top            =  0
   Width          =  1095
End
Begin VB.Label Label4
   Alignment      =  2  'Center
   BackColor      =  &H00808080&
   BorderStyle    =  1  'Fixed Single
   Caption        =  "Starting Time"
   BeginProperty Font
      name           =  "MS Sans Serif"
      charset        =  222
      weight         =  700
      size           =  8.25
      underline      =  0   'False
      italic         =  0   'False
      strikethrough  =  0   'False
   EndProperty
   Height         =  255
   Left           =  4080
   TabIndex       =  3
   Top            =  0
   Width          =  1470
End
Begin MSGrid.Grid Table
   Height         =  1335
   Left           =  120
   TabIndex       =  2
   Top            =  480
   Width          =  4815
   _Version       =  65536
   _ExtentX       =  8493
   _ExtentY       =  2355
   _StockProps    =  77
   BackColor      =  16777215
   BeginProperty Font {0BE35203-8F91-11CE-9DE3-00AA004BB851}
      name           =  "MS Sans Serif"
      charset        =  222
```

```
      weight         =  700
      size           =  8.25
      underline      =  0   'False
      italic         =  0   'False
      strikethrough  =  0   'False
    EndProperty
    BorderStyle    =  0
    Rows           =  1
    Cols           =  7
    FixedRows      =  0
    FixedCols      =  0
    ScrollBars     =  2
  End
  Begin VB.Label Label7
    Alignment      =  2  'Center
    BackColor      =  &H00808080&
    BorderStyle    =  1  'Fixed Single
    Caption        =  "ProcessingTime"
    BeginProperty Font
      name           =  "MS Sans Serif"
      charset        =  222
      weight         =  700
      size           =  8.25
      underline      =  0   'False
      italic         =  0   'False
      strikethrough  =  0   'False
    EndProperty
    Height         =  255
    Left           =  6600
    TabIndex       =  1
    Top            =  0
    Width          =  975
  End
  Begin VB.Label Border
    BorderStyle    =  1  'Fixed Single
    BeginProperty Font
      name           =  "MS Sans Serif"
      charset        =  222
      weight         =  700
      size           =  8.25
      underline      =  0   'False
      italic         =  0   'False
      strikethrough  =  0   'False
    EndProperty
    Height         =  2655
    Left           =  0
    TabIndex       =  9
    Top            =  360
    Width          =  6135
  End
End
Attribute VB_Name = "JobTable"
Attribute VB_Creatable = False
Attribute VB_Exposed = False
Sub Fill_Table()
```

```
Dim First, cur As Integer
Dim Quit1, Quit2 As Boolean
Dim tKey, tKey2 As String

Table.ColAlignment(0) = 1
Table.ColAlignment(1) = 0
Table.ColAlignment(2) = 0
Table.ColAlignment(3) = 0
Table.ColAlignment(4) = 1
Table.ColAlignment(5) = 1
Table.ColAlignment(6) = 1
Dat.job.Recordset.MoveLast
Dat.process.Recordset.MoveLast
Dat.datas.Recordset.MoveLast
Table.Rows = 1
First = 0
For i = 0 To Dat.machine.Recordset.RecordCount - 1
   If i <> 0 Then
      Table.AddItem "", Table.Rows
      First = Table.Rows - 1
   End If
   Dat.machine.Recordset.AbsolutePosition = i
   tKey = "machine_number = " & Str(i)
   Dat.datas.Recordset.FindFirst tKey
   Dat.process.Recordset.AbsolutePosition = Dat.datas.Recordset.AbsolutePosition
   tKey2 = "job_number = " & Str(Dat.process.Recordset("job_number"
   Dat.job.Recordset.FindFirst tKey2
   Table.Row = First
   Table.Col = 0
   Table.Text = ""
   Table.Col = 1
   Table.Text = ""
   Table.Col = 2
   Table.Text = Dat.job.Recordset("job_name")
   Table.Col = 3
   Table.Text = Dat.process.Recordset("process_name")
   Table.Col = 4
   Table.Text = Format(Dat.datas.Recordset("start"), "#,##0.00")
   Table.Col = 5
   Table.Text = Format(Dat.datas.Recordset("end"), "#,##0.00")
   Table.Col = 6
   Table.Text = Format(Dat.process.Recordset("processing_time"), "#,##0.00"
   Quit1 = False
   Do
      Dat.datas.Recordset.FindNext tKey
      If Not (Dat.datas.Recordset.NoMatch) Then
         Quit2 = False
         cur = First
         Do
            Table.Row = cur
            Table.Col = 4
            If Dat.datas.Recordset("start") < CDbl(Table.Text) Then
               Quit2 = True
            Else
               cur = cur + 1
```

```
                If cur = Table.Rows Then Quit2 = True
              End If
            Loop Until Quit2
            Table.AddItem "", cur
            Table.Row = cur
            Dat.process.Recordset.AbsolutePosition = Dat.datas.Recordset.AbsolutePositio
            tKey2 = "job_number = " & Str(Dat.process.Recordset("job_number"))
            Dat.job.Recordset.FindFirst tKey2
            Table.Col = 0
            Table.Text = ""
            Table.Col = 1
            Table.Text = ""
            Table.Col = 2
            Table.Text = Dat.job.Recordset("job_name")
            Table.Col = 3
            Table.Text = Dat.process.Recordset("process_name")
            Table.Col = 4
            Table.Text = Format(Dat.datas.Recordset("start"), "#,##0.00"
            Table.Col = 5
            Table.Text = Format(Dat.datas.Recordset("end"), "#,##0.00")
            Table.Col = 6
            Table.Text = Format(Dat.process.Recordset("processing_time"), "#,##0.00'
          Else
            Quit1 = True
          End If
        Loop Until Quit1
        Table.Row = First
        Table.Col = 0
        Table.Text = Str(i + 1)
        Table.Col = 1
        Table.Text = Dat.machine.Recordset("machine_name")
    Next i
End Sub
Sub Arrange_form()
    Border.Left = 90
    Border.Top = 300
    Border.Width = JobTable.Width - 320
    Border.Height = JobTable.Height - 1200
    Table.Left = Border.Left + 40
    Table.Top = Border.Top + 40
    Table.Width = Border.Width - 80
    Table.Height = Border.Height - 80
    Quit.Left = Int((JobTable.Width - Quit.Width) / 2)
    Quit.Top = JobTable.Height - 820
    If Table.Height > (Table.RowHeight(0) + 15) * Table.Rows Then
        Label6.Top = 10
        Label6.Width = 500
        Label6.Left = 100
        Label7.Top = Label6.Top
        Label7.Width = 1400
        Label7.Left = JobTable.Width - Label7.Width - 220
        Label5.Top = Label6.Top
        Label5.Width = 1400
        Label5.Left = Label7.Left - Label5.Width - 20
        Label4.Top = Label6.Top
```

```
        Label4.Width = 1400
        Label4.Left = Label5.Left - Label4.Width - 20
        temp = Int((Label4.Left - 1000) / 3)
        Label3.Top = Label6.Top
        Label3.Width = temp
        Label3.Left = Label4.Left - temp - 20
        temp = Int((Label3.Left - 1000) / 2)
        Label2.Top = Label6.Top
        Label2.Width = temp
        Label2.Left = Label3.Left - temp - 20
        Label1.Top = Label6.Top
        Label1.Width = Label2.Left - 630
        Label1.Left = 610
        Table.ColWidth(0) = Label6.Width - 30
        Table.ColWidth(1) = Label1.Width
        Table.ColWidth(2) = Label2.Width
        Table.ColWidth(3) = Label3.Width
        Table.ColWidth(4) = Label4.Width
        Table.ColWidth(5) = Label5.Width
        Table.ColWidth(6) = Label7.Width - 30
    Else
        Label6.Top = 10
        Label6.Width = 500
        Label6.Left = 100
        Label7.Top = Label6.Top
        Label7.Width = 1400
        Label7.Left = JobTable.Width - Label7.Width - 480
        Label5.Top = Label6.Top
        Label5.Width = 1400
        Label5.Left = Label7.Left - Label5.Width - 20
        Label4.Top = Label6.Top
        Label4.Width = 1400
        Label4.Left = Label5.Left - Label4.Width - 20
        temp = Int((Label4.Left - 1000) / 3)
        Label3.Top = Label6.Top
        Label3.Width = temp
        Label3.Left = Label4.Left - temp - 20
        temp = Int((Label3.Left - 1000) / 2)
        Label2.Top = Label6.Top
        Label2.Width = temp
        Label2.Left = Label3.Left - temp - 20
        Label1.Top = Label6.Top
        Label1.Width = Label2.Left - 630
        Label1.Left = 610
        Table.ColWidth(0) = Label6.Width - 30
        Table.ColWidth(1) = Label1.Width
        Table.ColWidth(2) = Label2.Width
        Table.ColWidth(3) = Label3.Width
        Table.ColWidth(4) = Label4.Width
        Table.ColWidth(5) = Label5.Width
        Table.ColWidth(6) = Label7.Width - 25
    End If
End Sub

Private Sub Form_Activate()
```

```
    Arrange_form
End Sub

Private Sub Form_Resize()
    If JobTable.WindowState <> 1 Then
        If JobTable.Width < 9000 Then JobTable.Width = 9000
        If JobTable.Height < 3000 Then JobTable.Height = 3000
        Arrange_form
    End If
End Sub


Private Sub Form_Unload(Cancel As Integer)
    JobTable.Enabled = False
    JobTable.Visible = False
    Unload JobTable
    Main.Enabled = True
    Main.Visible = True
End Sub


Private Sub Quit_Click()
    JobTable.Enabled = False
    JobTable.Visible = False
    Unload JobTable
    Main.Enabled = True
    Main.Visible = True
End Sub
```

```
VERSION 4.00
Begin VB.Form MachineBreak
   Caption        =  "Machine Breakdown Time Table"
   ClientHeight   =  5430
   ClientLeft     =  1425
   ClientTop      =  1950
   ClientWidth    =  7410
   Height         =  5835
   Left           =  1365
   LinkTopic      =  "Form1"
   ScaleHeight    =  5430
   ScaleWidth     =  7410
   Top            =  1605
   Width          =  7530
   Begin VB.TextBox Box
      Height         =  315
      Left           =  720
      TabIndex       =  8
      Top            =  4440
      Width          =  1335
   End
   Begin VB.VScrollBar Scroll
      Height         =  3255
      Left           =  6960
      TabIndex       =  7
      Top            =  480
      Width          =  255
   End
   Begin VB.CommandButton Ok
      Caption        =  "&Close"
      BeginProperty Font
         name           =  "MS Sans Serif"
         charset        =  222
         weight         =  700
         size           =  8.25
         underline      =  0   'False
         italic         =  0   'False
         strikethrough  =  0   'False
      EndProperty
      Height         =  405
      Left           =  3240
      TabIndex       =  0
      Top            =  4800
      Width          =  1335
   End
   Begin VB.Label Label4
      Alignment      =  2  'Center
      BackColor      =  &H00808080&
      BorderStyle    =  1  'Fixed Single
      Caption        =  "Ending Time"
      BeginProperty Font
         name           =  "MS Sans Serif"
         charset        =  222
         weight         =  700
         size           =  8.25
```

```
    underline      = 0   'False
    italic         = 0   'False
    strikethrough  = 0   'False
  EndProperty
  Height        = 255
  Left          = 3960
  TabIndex      = 6
  Top           = 0
  Width         = 1335
End
Begin MSGrid.Grid Data
  Height        = 1935
  Left          = 120
  TabIndex      = 4
  Top           = 600
  Width         = 5295
  _Version      = 65536
  _ExtentX      = 9340
  _ExtentY      = 3413
  _StockProps   = 77
  BackColor     = 16777215
  BeginProperty Font {0BE35203-8F91-11CE-9DE3-00AA004BB851}
    name          = "MS Sans Serif"
    charset       = 222
    weight        = 700
    size          = 9.75
    underline     = 0   'False
    italic        = 0   'False
    strikethrough = 0   'False
  EndProperty
  BorderStyle   = 0
  Rows          = 1
  Cols          = 4
  FixedRows     = 0
  FixedCols     = 0
  ScrollBars    = 0
End
Begin VB.Label Label3
  Alignment     = 2  'Center
  BackColor     = &H00808080&
  BorderStyle   = 1  'Fixed Single
  Caption       = "Starting Time"
  BeginProperty Font
    name          = "MS Sans Serif"
    charset       = 222
    weight        = 700
    size          = 8.25
    underline     = 0   'False
    italic        = 0   'False
    strikethrough = 0   'False
  EndProperty
  Height        = 255
  Left          = 2520
  TabIndex      = 3
  Top           = 0
```

```
    Width           =  1335
  End
  Begin VB.Label Label2
    Alignment       =  2  'Center
    BackColor       =  &H00808080&
    BorderStyle     =  1  'Fixed Single
    Caption         =  "Machine Name"
    BeginProperty Font
      name          =  "MS Sans Serif"
      charset       =  222
      weight        =  700
      size          =  8.25
      underline     =  0   'False
      italic        =  0   'False
      strikethrough =  0   'False
    EndProperty
    Height          =  255
    Left            =  720
    TabIndex        =  2
    Top             =  0
    Width           =  1695
  End
  Begin VB.Label Label1
    Alignment       =  2  'Center
    BackColor       =  &H00808080&
    BorderStyle     =  1  'Fixed Single
    Caption         =  "No."
    BeginProperty Font
      name          =  "MS Sans Serif"
      charset       =  222
      weight        =  700
      size          =  8.25
      underline     =  0   'False
      italic        =  0   'False
      strikethrough =  0   'False
    EndProperty
    Height          =  255
    Left            =  0
    TabIndex        =  1
    Top             =  0
    Width           =  615
  End
  Begin VB.Label Border
    BorderStyle     =  1  'Fixed Single
    BeginProperty Font
      name          =  "MS Sans Serif"
      charset       =  222
      weight        =  700
      size          =  8.25
      underline     =  0   'False
      italic        =  0   'False
      strikethrough =  0   'False
    EndProperty
    Height          =  3255
    Left            =  0
```

```
    TabIndex        =   5
    Top             =   480
    Width           =   6735
  End
End
Attribute VB_Name = "MachineBreak"
Attribute VB_Creatable = False
Attribute VB_Exposed = False
Sub Fill_Table()
  Dim util As Double
  Data.ColAlignment(0) = 1
  Data.ColAlignment(1) = 0
  Data.ColAlignment(2) = 1
  Data.ColAlignment(3) = 1
  Data.Rows = Dat.machine.Recordset.RecordCount
  Dat.machine.Recordset.MoveLast
  util = 0
  For i = 0 To Dat.machine.Recordset.RecordCount - 1
    Dat.machine.Recordset.AbsolutePosition = i
    Data.Row = i
    Data.Col = 0
    Data.Text = i + 1
    Data.Col = 1
    Data.Text = Dat.machine.Recordset("machine_name")
    Data.Col = 2
    Data.Text = Format(Dat.machine.Recordset("b_start"), "#,##0.00"
    Data.Col = 3
    Data.Text = Format(Dat.machine.Recordset("b_stop"), "#,##0.00")
  Next i
End Sub


Sub Arrange_form()
  Border.Left = 90
  Border.Top = 300
  Border.Width = MachineBreak.Width - 320
  Border.Height = MachineBreak.Height - 1200
  Ok.Left = Int((MachineBreak.Width - Ok.Width) / 2)
  Ok.Top = MachineBreak.Height - 820
  If Data.Height > (Data.RowHeight(0) + 15) * Data.Rows Then
    Scroll.Visible = False
    Data.Left = Border.Left + 40
    Data.Top = Border.Top + 40
    Data.Width = Border.Width - 80
    Data.Height = Border.Height - 80
    Label1.Top = 10
    Label1.Width = 600
    Label1.Left = Border.Left
    Label2.Top = Label1.Top
    Label2.Width = Int((Border.Width - Label1.Width) * 0.5)
    Label2.Left = Label1.Left + Label1.Width + 10
    temp = Border.Width - Label1.Width - Label2.Width - 20
    Label3.Top = Label1.Top
    Label3.Width = Int(temp / 2)
    Label3.Left = Label2.Left + Label2.Width + 10
```

```
        temp = temp - Label3.Width - 20
        Label4.Top = Label1.Top
        Label4.Width = temp
        Label4.Left = Label3.Left + Label3.Width + 10
    Else
        Scroll.Visible = True
        Data.Left = Border.Left + 40
        Data.Top = Border.Top + 40
        Data.Width = Border.Width - 280
        Data.Height = Border.Height - 80
        Scroll.Top = Data.Top
        Scroll.Left = Data.Left + Data.Width - 80
        Scroll.Height = Data.Height
        Scroll.Width = Border.Width - Data.Width
        Scroll.Max = Data.Rows - Int(Data.Height / Data.RowHeight(0))
        Label1.Top = 10
        Label1.Width = 600
        Label1.Left = Border.Left
        Label2.Top = Label1.Top
        Label2.Width = Int((Border.Width - Label1.Width - 300) * 0.5)
        Label2.Left = Label1.Left + Label1.Width + 10
        temp = Border.Width - Label1.Width - Label2.Width - 320
        Label3.Top = Label1.Top
        Label3.Width = Int(temp / 2)
        Label3.Left = Label2.Left + Label2.Width + 10
        temp = temp - Label3.Width - 20
        Label4.Top = Label1.Top
        Label4.Width = temp
        Label4.Left = Label3.Left + Label3.Width + 10
    End If
    Data.ColWidth(0) = Label1.Width - 40
    Data.ColWidth(1) = Label2.Width
    Data.ColWidth(2) = Label3.Width - 30
    Data.ColWidth(3) = Label4.Width - 30
End Sub

Private Sub box_Change()
    Dim temp As Double

    Dat.machine.Recordset.AbsolutePosition = Data.Row
    If box.Text = "" Then
        temp = 0
    Else
        temp = CDbl(Format(box.Text, "###0.00"))
    End If
    If temp < 0 Then temp = 0
    If Data.Col = 2 Then
        If temp > Dat.machine.Recordset("b_stop") Then temp = Dat.machine.Recordset("b_stop")
        Dat.machine.Recordset.Edit
        Dat.machine.Recordset("b_start") = temp
        Dat.machine.Recordset.Update
        Data.Text = Format(Dat.machine.Recordset("b_start"), "##0.00")
    Else
        If temp < Dat.machine.Recordset("b_start") Then temp = Dat.machine.Recordset("b_start")
        Dat.machine.Recordset.Edit
```

```
        Dat.machine.Recordset("b_stop") = temp
        Dat.machine.Recordset.Update
        Data.Text = Format(Dat.machine.Recordset("b_stop"), "##0.00")
    End If
End Sub

Private Sub box_GotFocus()
    box.SelStart = 0
    box.SelLength = Len(box.Text)
End Sub


Private Sub box_KeyPress(KeyAscii As Integer)
    Dim temp As Double

    If KeyAscii = 13 Then
        Dat.machine.Recordset.AbsolutePosition = Data.Row
        If box.Text = "" Then
            temp = 0
        Else
            temp = CDbl(Format(box.Text, "###0.00"))
        End If
        If temp < 0 Then temp = 0
        If Data.Col = 2 Then
            If temp > Dat.machine.Recordset("b_stop") Then temp = Dat.machine.Recordset("b_stop")
            Dat.machine.Recordset.Edit
            Dat.machine.Recordset("b_start") = temp
            Dat.machine.Recordset.Update
            Data.Text = Format(Dat.machine.Recordset("b_start"), "##0.00")
        Else
            If temp < Dat.machine.Recordset("b_start") Then temp = Dat.machine.Recordset("b_start")
                Dat.machine.Recordset.Edit
                Dat.machine.Recordset("b_stop") = temp
                Dat.machine.Recordset.Update
                Data.Text = Format(Dat.machine.Recordset("b_stop"), "##0.00")
            End If
        box.Visible = False
    End If
End Sub


Private Sub Data_Click()
    If Data.SelStartCol >= 2 Then
        If (Data.SelStartRow - Data.TopRow + 1) * (Data.RowHeight(0) + 15) > Data.Height Then
            Data.TopRow = Data.TopRow + 1
        End If
        box.Top = Data.Top + (Data.SelStartRow - Data.TopRow) * (Data.RowHeight(0) + 15) - 2(
        If Data.SelStartCol = 2 Then
            box.Left = 10 + Data.Left + Data.ColWidth(0) + Data.ColWidth(1)
            box.Width = Data.ColWidth(2) + 50
        Else
            box.Left = 10 + Data.Left + Data.ColWidth(0) + Data.ColWidth(1) + Data.ColWidth(2)
            box.Width = Data.ColWidth(3) + 50
        End If
        Data.Row = Data.SelStartRow
```

```
        Data.Col = Data.SelStartCol
        box.Text = Data.Text
        box.Visible = True
        box.SetFocus
    Else
        box.Visible = False
    End If
End Sub

Private Sub Data_RowColChange()
    box.Visible = False
    Scroll.Value = Data.TopRow
End Sub

Private Sub Form_Activate()
    Arrange_form
End Sub

Private Sub Form_Resize()
    If Table.WindowState <> 1 Then
        If MachineBreak.Width < 5000 Then MachineBreak.Width = 5000
        If MachineBreak.Height < 2500 Then MachineBreak.Height = 2500
        box.Visible = False
        Arrange_form
    End If
End Sub

Private Sub Form_Unload(Cancel As Integer)
    MachineBreak.Enabled = False
    MachineBreak.Visible = False
    Unload MachineBreak
    Main.Enabled = True
    Main.Visible = True
    Main.SetFocus
End Sub

Private Sub Ok_Click()
    MachineBreak.Enabled = False
    MachineBreak.Visible = False
    Unload MachineBreak
    Main.Enabled = True
    Main.Visible = True
    Main.SetFocus
End Sub
Private Sub Scroll_Change()
    box.Visible = False
    Data.TopRow = Scroll.Value
End Sub
```

```
VERSION 4.00
Begin VB.Form Main
   BackColor       =   &H00C0C0C0&
   Caption         =   "Production Scheduling / Rescheduling"
   ClientHeight    =   5025
   ClientLeft      =   210
   ClientTop       =   1800
   ClientWidth     =   9270
   BeginProperty Font
      name            =   "MS Sans Serif"
      charset         =   222
      weight          =   700
      size            =   8.25
      underline       =   0   'False
      italic          =   0   'False
      strikethrough   =   0   'False
   EndProperty
   Height          =   5715
   Left            =   150
   LinkTopic       =   "Form1"
   ScaleHeight     =   5025
   ScaleWidth      =   9270
   Top             =   1170
   Width           =   9390
   Begin VB.Frame Oper_Frame
      Caption         =   "Operation"
      Height          =   3495
      Left            =   4560
      TabIndex        =   16
      Top             =   120
      Width           =   4575
      Begin VB.TextBox iProcessing_Time
         Height          =   285
         Left            =   480
         TabIndex        =   4
         Top             =   2880
         Width           =   3735
      End
      Begin VB.TextBox iMachine_Name
         Height          =   285
         Left            =   480
         TabIndex        =   3
         Top             =   1800
         Width           =   3735
      End
      Begin VB.TextBox iOper_Name
         Height          =   285
         Left            =   480
         TabIndex        =   2
         Top             =   840
         Width           =   3735
      End
      Begin VB.Label Label5
         AutoSize        =   -1  'True
         Caption         =   "Processing Time"
```

```
    Height          =  195
    Left            =  480
    TabIndex        =  21
    Top             =  2400
    Width           =  1395
  End
  Begin VB.Label Label4
    AutoSize        =  -1  'True
    Caption         =  "Machine Name"
    Height          =  195
    Left            =  480
    TabIndex        =  20
    Top             =  1440
    Width           =  1260
  End
  Begin VB.Label Label3
    AutoSize        =  -1  'True
    Caption         =  "Operation Name"
    Height          =  195
    Left            =  480
    TabIndex        =  19
    Top             =  480
    Width           =  1365
  End
End
Begin VB.Frame Job_Frame
  Caption         =  "Job"
  Height          =  3495
  Left            =  120
  TabIndex        =  15
  Top             =  120
  Width           =  4335
  Begin VB.TextBox iDue_Date
    DataField       =  "Due_date"
    DataSource      =  "Dat.job"
    Height          =  285
    Left            =  360
    TabIndex        =  1
    Top             =  1800
    Width           =  3615
  End
  Begin VB.TextBox iJob_Name
    DataField       =  "Job_name"
    DataSource      =  "Dat.job"
    Height          =  285
    Left            =  360
    TabIndex        =  0
    Top             =  840
    Width           =  3615
  End
  Begin VB.Label Label2
    AutoSize        =  -1  'True
    Caption         =  "Due Date"
    Height          =  195
    Left            =  360
```

```
    TabIndex        =  18
    Top             =  1440
    Width           =  810
  End
  Begin VB.Label Label1
    AutoSize        =  -1  'True
    Caption         =  "Job Name"
    Height          =  195
    Left            =  360
    TabIndex        =  17
    Top             =  480
    Width           =  840
  End
End
Begin VB.CommandButton Next_Job
  Caption           =  "Next Job"
  Height            =  345
  Left              =  2280
  TabIndex          =  6
  Top               =  3720
  Width             =  2175
End
Begin VB.CommandButton Pre_Job
  Caption           =  "Previous Job"
  Height            =  345
  Left              =  120
  TabIndex          =  5
  Top               =  3720
  Width             =  2175
End
Begin VB.CommandButton Del_Oper
  Caption           =  "Delete Operation"
  Height            =  345
  Left              =  4560
  TabIndex          =  14
  Top               =  4440
  Width             =  2295
End
Begin VB.CommandButton Insert_Oper
  Caption           =  "Insert Operation"
  Height            =  345
  Left              =  4560
  TabIndex          =  12
  Top               =  4080
  Width             =  2295
End
Begin VB.CommandButton Insert_Job
  Caption           =  "Insert Job"
  Height            =  345
  Left              =  120
  TabIndex          =  7
  Top               =  4080
  Width             =  2175
End
Begin VB.CommandButton Add_Oper
```

```
   Caption        =  "Add Operation"
   Height         =  345
   Left           =  6840
   TabIndex       =  13
   Top            =  4080
   Width          =  2295
End
Begin VB.CommandButton Del_Job
   BackColor      =  &H00FFFFFF&
   Caption        =  "Delete Job"
   Height         =  345
   Left           =  120
   TabIndex       =  9
   Top            =  4440
   Width          =  2175
End
Begin VB.CommandButton Add_Job
   Caption        =  "Add Job"
   Height         =  345
   Left           =  2280
   TabIndex       =  8
   Top            =  4080
   Width          =  2175
End
Begin VB.CommandButton Pre_Oper
   Caption        =  "Previous Operation"
   Height         =  345
   Left           =  4560
   TabIndex       =  10
   Top            =  3720
   Width          =  2295
End
Begin VB.CommandButton Next_Oper
   Caption        =  "Next Operation"
   Height         =  345
   Left           =  6840
   TabIndex       =  11
   Top            =  3720
   Width          =  2295
End
Begin MSComDlg.CommonDialog Save_Dia
   Left           =  8280
   Top            =  4560
   _Version       =  65536
   _ExtentX       =  847
   _ExtentY       =  847
   _StockProps    =  0
   DefaultExt     =  "*.DAT"
   DialogTitle    =  " Save as"
   FileName       =  "Data.DAT"
   Filter         =  "Data Files (*.DAT)|*.DAT|All Files (*.*)|*.*"
End
Begin MSComDlg.CommonDialog Open_Dia
   Left           =  7800
   Top            =  4560
```

```
    _Version        =  65536
    _ExtentX        =  847
    _ExtentY        =  847
    _StockProps     =  0
    DefaultExt      =  "*.DAT"
    DialogTitle     =  "Open"
    Filter          =  "Data Files (*.DAT)|*.DAT|All Files (*.*)|*.*"
  End
  Begin VB.Menu mnuFile
    Caption         =  "&File"
    Begin VB.Menu mnuNew
      Caption       =  "&New"
    End
    Begin VB.Menu mnuOpen
      Caption       =  "&Open"
      Shortcut      =  {F3}
    End
    Begin VB.Menu mnuClose
      Caption       =  "&Close"
    End
    Begin VB.Menu mnuSave
      Caption       =  "&Save"
      Shortcut      =  {F2}
    End
    Begin VB.Menu mnuSaveas
      Caption       =  "Save &as"
    End
    Begin VB.Menu mnuPrint
      Caption       =  "&Print"
    End
    Begin VB.Menu mnuNone0
      Caption       =  "-"
    End
    Begin VB.Menu mnuExit
      Caption       =  "E&xit"
    End
  End
  Begin VB.Menu mnuSchedule
    Caption         =  "&Schedule"
    Begin VB.Menu mnuEDD
      Caption       =  "&0  EDD"
    End
    Begin VB.Menu mnuSPT
      Caption       =  "&1  SPT"
    End
    Begin VB.Menu mnuLPT
      Caption       =  "&2  LPT"
    End
    Begin VB.Menu mnuSDT
      Caption       =  "&3  SDT"
    End
    Begin VB.Menu mnuLDT
      Caption       =  "&4  LDT"
    End
    Begin VB.Menu mnuSMT
```

```
    Caption         =  "&5  SMT"
  End
  Begin VB.Menu mnuLMT
    Caption         =  "&6  LMT"
  End
  Begin VB.Menu mnuSlack
    Caption         =  "&7  SLACK"
  End
  Begin VB.Menu mnuSlackTP
    Caption         =  "&8  SLACK/TP"
  End
  Begin VB.Menu mnuRandom
    Caption         =  "&9  RANDOM"
  End
End
Begin VB.Menu mnuReschedule
  Caption         =  "&Reschedule"
  Begin VB.Menu mnuInput
    Caption         =  "&Generate Machine"
  End
  Begin VB.Menu mnuBDT
    Caption         =  "&Breakdown Table"
  End
  Begin VB.Menu mnuNone1
    Caption         =  "-"
  End
  Begin VB.Menu mnuInputMR
    Caption         =  "Input Alternative &Machine"
  End
  Begin VB.Menu mnuNone2
    Caption         =  "-"
  End
  Begin VB.Menu mnuRG
    Caption         =  "Generate &Chart"
  End
  Begin VB.Menu mnuOption
    Caption         =  "&Option"
    Begin VB.Menu mnuNoRule
      Caption         =  "&No Rule"
    End
    Begin VB.Menu mnuREDD
      Caption         =  "&0 EDD"
    End
    Begin VB.Menu mnuRSPT
      Caption         =  "&1 SPT"
    End
    Begin VB.Menu mnuRLPT
      Caption         =  "&2 LPT"
    End
    Begin VB.Menu mnuRSDT
      Caption         =  "&3 SDT"
    End
    Begin VB.Menu mnuRLDT
      Caption         =  "&4 LDT"
    End
```

```
      Begin VB.Menu mnuRSMT
        Caption         =  "&5 SMT"
      End
      Begin VB.Menu mnuRLMT
        Caption         =  "&6 LMT"
      End
      Begin VB.Menu mnuRSlack
        Caption         =  "&7 SLACK"
      End
      Begin VB.Menu mnuRSlackTP
        Caption         =  "&8 SLACK/TP"
      End
      Begin VB.Menu mnuRRandom
        Caption         =  "&9 RANDOM"
      End
    End
  End
  Begin VB.Menu mnuView
    Caption         =  "&View"
    Begin VB.Menu mnuJobDS
      Caption         =  "&Job Description"
      Begin VB.Menu mnuTable
        Caption         =  "&Job Table"
      End
    End
    Begin VB.Menu mnuSS
      Caption         =  "&Schedule_s"
      Begin VB.Menu mnuT
        Caption         =  "&Table"
        Begin VB.Menu mnuS
          Caption         =  "&Job"
        End
        Begin VB.Menu mnuTM
          Caption         =  "&Machine"
        End
      End
      Begin VB.Menu mnuGC
        Caption         =  "&Gantt Chart"
        Begin VB.Menu mnuJob
          Caption         =  "&Job"
        End
        Begin VB.Menu mnuGrantChart
          Caption         =  "&Machine"
        End
      End
      Begin VB.Menu mnuPerform
        Caption         =  "&Performance"
        Begin VB.Menu mnuPJ
          Caption         =  "&Job"
        End
        Begin VB.Menu mnuPM
          Caption         =  "&Machine"
        End
        Begin VB.Menu mnuPU
          Caption         =  "&Utilization Graph"
```

```
        End
      End
    End
    Begin VB.Menu mnuR
      Caption         =   "&Reschedule_s"
      Begin VB.Menu mnuRT
        Caption         =   "&Table"
        Begin VB.Menu mnuRD
          Caption         =   "&Job"
        End
        Begin VB.Menu mnuRTM
          Caption         =   "&Machine"
        End
      End
      Begin VB.Menu mnuRGC
        Caption         =   "&Gantt Chart"
        Begin VB.Menu mnuRJob
          Caption         =   "&Job"
        End
        Begin VB.Menu mnuRChart
          Caption         =   "&Machine"
        End
      End
      Begin VB.Menu mnuRP
        Caption         =   "&Performance"
        Begin VB.Menu mnuRPerform
          Caption         =   "&Job"
        End
        Begin VB.Menu mnuRPM
          Caption         =   "&Machine"
        End
        Begin VB.Menu mnuRPU
          Caption         =   "&Utilization Graph"
        End
      End
    End
  End
End
Attribute VB_Name = "Main"
Attribute VB_Creatable = False
Attribute VB_Exposed = False
Public Edited As Boolean
Dim FileName As String
Dim first_in As Boolean
Sub Arrange_form()
    Job_Frame.Left = 100
    Job_Frame.Top = 100
    Job_Frame.Width = Int((Main.Width - 400) / 2)
    Job_Frame.Height = Main.Height - 2000
    Oper_Frame.Left = Job_Frame.Left + Job_Frame.Width + 100
    Oper_Frame.Top = Job_Frame.Top
    Oper_Frame.Width = Job_Frame.Width
    Oper_Frame.Height = Job_Frame.Height
    Pre_Job.Left = Job_Frame.Left
    Pre_Job.Top = Job_Frame.Top + Job_Frame.Height + 100
```

```
    Pre_Job.Width = Int(Job_Frame.Width / 2)
    Next_Job.Left = Pre_Job.Left + Pre_Job.Width + 5
    Next_Job.Top = Pre_Job.Top
    Next_Job.Width = Pre_Job.Width
    Insert_Job.Left = Pre_Job.Left
    Insert_Job.Top = Pre_Job.Top + Pre_Job.Height
    Insert_Job.Width = Pre_Job.Width
    Add_Job.Left = Next_Job.Left
    Add_Job.Top = Next_Job.Top + Next_Job.Height
    Add_Job.Width = Next_Job.Width
    Del_Job.Left = Insert_Job.Left
    Del_Job.Top = Insert_Job.Top + Insert_Job.Height
    Del_Job.Width = Insert_Job.Width
    Pre_Oper.Left = Oper_Frame.Left
    Pre_Oper.Top = Pre_Job.Top
    Pre_Oper.Width = Int(Oper_Frame.Width / 2)
    Next_Oper.Left = Pre_Oper.Left + Pre_Oper.Width + 5
    Next_Oper.Top = Pre_Oper.Top
    Next_Oper.Width = Pre_Oper.Width
    Insert_Oper.Left = Pre_Oper.Left
    Insert_Oper.Top = Pre_Oper.Top + Pre_Oper.Height
    Insert_Oper.Width = Pre_Oper.Width
    Add_Oper.Left = Next_Oper.Left
    Add_Oper.Top = Next_Oper.Top + Next_Oper.Height
    Add_Oper.Width = Next_Oper.Width
    Del_Oper.Left = Insert_Oper.Left
    Del_Oper.Top = Insert_Oper.Top + Insert_Oper.Height
    Del_Oper.Width = Insert_Oper.Width
    Label1.Left = 200
    Label1.Top = 500
    iJob_Name.Left = Label1.Left
    iJob_Name.Top = Label1.Top + Label1.Height + 200
    iJob_Name.Width = Job_Frame.Width - 400
    Label2.Left = Label1.Left
    Label2.Top = iJob_Name.Top + iJob_Name.Height + 200
    idue_date.Left = Label1.Left
    idue_date.Top = Label2.Top + Label2.Height + 200
    idue_date.Width = iJob_Name.Width
    Label3.Left = Label1.Left
    Label3.Top = Label1.Top
    iOper_Name.Left = Label3.Left
    iOper_Name.Top = iJob_Name.Top
    iOper_Name.Width = Oper_Frame.Width - 400
    Label4.Left = Label3.Left
    Label4.Top = Label2.Top
    iMachine_Name.Left = Label3.Left
    iMachine_Name.Top = idue_date.Top
    iMachine_Name.Width = iOper_Name.Width
    Label5.Left = Label3.Left
    Label5.Top = iMachine_Name.Top + iMachine_Name.Height + 200
    iProcessing_Time.Left = Label3.Left
    iProcessing_Time.Top = Label5.Top + Label5.Height + 200
    iProcessing_Time.Width = iOper_Name.Width
End Sub
```

```
Sub Can0()
   P_State = 0
   Reschedule = False
   mnuFile.Enabled = True
      mnuClose.Enabled = False
      mnuSave.Enabled = False
      mnuSaveas.Enabled = False
      mnuPrint.Enabled = False
   mnuSchedule.Enabled = False
   mnuReschedule.Enabled = False
   mnuview.Enabled = False
End Sub

Sub Can1()
   P_State = 1
   Reschedule = False
      mnuClose.Enabled = True
      mnuSave.Enabled = True
      mnuSaveas.Enabled = True
      mnuPrint.Enabled = True
   mnuSchedule.Enabled = True
      mnuSPT.Checked = False
      mnuEDD.Checked = False
      mnuSLACK.Checked = False
      mnuRANDOM.Checked = False
      mnuLPT.Checked = False
      mnuSDT.Checked = False
      mnuLDT.Checked = False
      mnuSMT.Checked = False
      mnuLMT.Checked = False
      mnuSlackTP.Checked = False
   mnuReschedule.Enabled = False
   mnuview.Enabled = True
      mnuJobDS.Enabled = True
         mnuTable.Enabled = True
         mnuBDT.Enabled = False
      mnuSS.Enabled = False
      mnuR.Enabled = False
End Sub
Sub Can2()
   P_State = 2
   mnuReschedule.Enabled = True
      mnuInput.Enabled = True
      mnuRG.Enabled = True
      mnuInputMR.Enabled = True
      mnuoption.Enabled = True
         mnuNoRule.Checked = True
         mnuredd.Checked = False
         mnurspt.Checked = False
         mnuRLPT.Checked = False
         mnuRSDT.Checked = False
         mnuRLDT.Checked = False
         mnuRSMT.Checked = False
```

```
            mnuRLMT.Checked = False
            mnuRSlack.Checked = False
            mnuRSlackTP.Checked = False
            mnuRRandom.Checked = False
            RChartName = "Repeat"
        mnuSS.Enabled = True
            mnuBDT.Enabled = True
        Mc_Num = 0
End Sub

Sub Can3()
    P_State = 3
    Reschedule = True
        mnuR.Enabled = True
End Sub


Sub Close_Data()
    Job_Frame.Visible = False
    Oper_Frame.Visible = False
    Pre_Job.Visible = False
    Next_Job.Visible = False
    Insert_Job.Visible = False
    Add_Job.Visible = False
    Del_Job.Visible = False
    Pre_Oper.Visible = False
    Next_Oper.Visible = False
    Insert_Oper.Visible = False
    Add_Oper.Visible = False
    Del_Oper.Visible = False

    Chart.Visible = False
    JobChart.Visible = False
    McTable.Visible = False
    ScheduleTable.Visible = False
    Table.Visible = False

    RChart.Visible = False
    RJobChart.Visible = False
    RMcTable.Visible = False
    RescheduleTable.Visible = False
    RTable.Visible = False

    Job_Table.Visible = False
    MachineBreak.Visible = False
End Sub
Sub Fill_Form()
    Dat.job.Recordset.AbsolutePosition = Current_Job
    iJob_Name.Text = Dat.job.Recordset("job_name")
    Dat.job.Recordset.AbsolutePosition = Current_Job
    idue_date.Text = Dat.job.Recordset("due_date")
    Dat.process.Recordset.AbsolutePosition = First_Pos + Current_Oper
    iOper_Name.Text = Dat.process.Recordset("process_name")
    Dat.process.Recordset.AbsolutePosition = First_Pos + Current_Oper
    iMachine_Name.Text = Dat.process.Recordset("machine_name")
```

```
    Dat.process.Recordset.AbsolutePosition = First_Pos + Current_Oper
    iProcessing_Time.Text = Format(Dat.process.Recordset("processing_time"), "###0.00")
End Sub


Sub Show_Data()
    Job_Frame.Visible = True
    Oper_Frame.Visible = True
    Pre_Job.Visible = True
    Next_Job.Visible = True
    Insert_Job.Visible = True
    Add_Job.Visible = True
    Del_Job.Visible = True
    Pre_Oper.Visible = True
    Next_Oper.Visible = True
    Insert_Oper.Visible = True
    Add_Oper.Visible = True
    Del_Oper.Visible = True
End Sub



Sub Job_LMove(Pos As Integer)
    Dim Stemp As String
    Dim ITemp(0 To 2) As Integer
    Dim Stemp2 As String
    Dim ITemp2(0 To 2) As Integer

    Dat.job.Recordset.MoveLast
    ITemp2(0) = Dat.job.Recordset("Job_number")
    Stemp2 = Dat.job.Recordset("Job_name")
    ITemp2(1) = Dat.job.Recordset("due_date")
    ITemp2(2) = Dat.job.Recordset("process")
    If Pos < Dat.job.Recordset.RecordCount - 1 Then
       For i = 1 To Dat.job.Recordset.RecordCount - Pos - 1
          Dat.job.Recordset.MovePrevious
          ITemp(0) = Dat.job.Recordset("Job_number")
          Stemp = Dat.job.Recordset("Job_name")
          ITemp(1) = Dat.job.Recordset("due_date")
          ITemp(2) = Dat.job.Recordset("process")
          Dat.job.Recordset.MoveNext
          Dat.job.Recordset.Edit
          Dat.job.Recordset("Job_number") = ITemp(0)
          Dat.job.Recordset("Job_name") = Stemp
          Dat.job.Recordset("due_date") = ITemp(1)
          Dat.job.Recordset("process") = ITemp(2)
          Dat.job.Recordset.Update
          Dat.job.Recordset.MovePrevious
       Next i
    End If
    Dat.job.Recordset.Edit
    Dat.job.Recordset("Job_number") = ITemp2(0)
    Dat.job.Recordset("Job_name") = Stemp2
    Dat.job.Recordset("due_date") = ITemp2(1)
    Dat.job.Recordset("process") = ITemp2(2)
```

```
    Dat.job.Recordset.Update
    Current_Job = Dat.job.Recordset.AbsolutePosition
End Sub

Sub New_Work()
    Clear_Record Dat.job
    Clear_Record Dat.process
    Edited = False
    New_Job
    First_Pos = 0
    Current_Oper = 0
    Dat.job.Recordset.AbsolutePosition = Current_Job
    Dat.process.Recordset.AbsolutePosition = First_Pos + Current_Oper
    Fill_Form
    Show_Data
    Pre_Job.Enabled = False
    Next_Job.Enabled = False
    Pre_Oper.Enabled = False
    Next_Oper.Enabled = False
    Del_Job.Enabled = False
    Del_Oper.Enabled = False
End Sub

Sub Process_LMove(ByVal Pos As Integer)
    Dim Stemp(0 To 1) As String
    Dim ITemp(0 To 2) As Integer
    Dim Stemp2(0 To 1) As String
    Dim ITemp2(0 To 1) As Integer

    Dat.process.Recordset.MoveLast
    ITemp2(0) = Dat.process.Recordset("Job_number")
    Stemp2(0) = Dat.process.Recordset("Process_name")
    Stemp2(1) = Dat.process.Recordset("machine_name")
    ITemp2(1) = Dat.process.Recordset("Processing_time")
    If Pos < Dat.process.Recordset.RecordCount - 1 Then
       For i = 1 To Dat.process.Recordset.RecordCount - Pos - 1
          Dat.process.Recordset.MovePrevious
          ITemp(0) = Dat.process.Recordset("Job_number")
          Stemp(0) = Dat.process.Recordset("Process_name")
          Stemp(1) = Dat.process.Recordset("machine_name")
          ITemp(1) = Dat.process.Recordset("Processing_time")
          Dat.process.Recordset.MoveNext
          Dat.process.Recordset.Edit
          Dat.process.Recordset("Job_number") = ITemp(0)
          Dat.process.Recordset("Process_name") = Stemp(0)
          Dat.process.Recordset("machine_name") = Stemp(1)
          Dat.process.Recordset("Processing_time") = ITemp(1)
          Dat.process.Recordset.Update
          Dat.process.Recordset.MovePrevious
       Next i
    End If
    Dat.process.Recordset.Edit
    Dat.process.Recordset("Job_number") = ITemp2(0)
    Dat.process.Recordset("Process_name") = Stemp2(0)
    Dat.process.Recordset("machine_name") = Stemp2(1)
```

```
    Dat.process.Recordset("Processing_time") = ITemp2(1)
    Dat.process.Recordset.Update
    Current_Oper = Pos - First_Pos
End Sub

Sub New_Job()
    Dim j_num As Integer

    j_num = 0
    If Dat.job.Recordset.RecordCount > 0 Then
        found = False
        Do
            key = "job_number = " & Str(j_num)
            Dat.job.Recordset.FindFirst key
            If Dat.job.Recordset.NoMatch Then
                found = True
            Else
                j_num = j_num + 1
            End If
        Loop Until found
    End If
    Dat.job.Recordset.AddNew
    Dat.job.Recordset("job_number") = j_num
    Dat.job.Recordset("job_name") = ""
    Dat.job.Recordset("process") = 1
    Dat.job.Recordset("due_date") = 0
    Dat.job.Recordset.Update
    Dat.job.Recordset.MoveLast
    New_Process j_num
End Sub

Sub New_Process(Job_id As Integer)
    Dat.process.Recordset.AddNew
    Dat.process.Recordset("Job_number") = Job_id
    Dat.process.Recordset("Process_name") = ""
    Dat.process.Recordset("machine_name") = ""
    Dat.process.Recordset("Processing_time") = 0
    Dat.process.Recordset.Update
End Sub

Sub Set_First_Pos()
    First_Pos = 0
    If Current_Job > 0 Then
        For i = 0 To Current_Job - 1
            Dat.job.Recordset.AbsolutePosition = i
            First_Pos = First_Pos + Dat.job.Recordset("process")
        Next i
    End If
End Sub

Sub ShutWin()
    Job_Table.Enabled = False
    Job_Table.Visible = False
    ScheduleTable.Enabled = False
    ScheduleTable.Visible = False
```

```
    JobTable.Enabled = False
    JobTable.Visible = False
    Chart.Enabled = False
    Chart.Visible = False
    JobChart.Enabled = False
    JobChart.Visible = False
    Table.Enabled = False
    Table.Visible = False
    McTable.Enabled = False
    McTable.Visible = False
    McReplace.Enabled = False
    McReplace.Visible = False
    MachineBreak.Enabled = False
    MachineBreak.Visible = False
    RescheduleTable.Enabled = False
    RescheduleTable.Visible = False
    ReJobTable.Enabled = False
    ReJobTable.Visible = False
    RChart.Enabled = False
    RChart.Visible = False
    RJobChart.Enabled = False
    RJobChart.Visible = False
    RTable.Enabled = False
    RTable.Visible = False
    RMcTable.Enabled = False
    RMcTable.Visible = False
End Sub

Private Sub Add_Job_Click()
    New_Job
    Current_Job = Dat.job.Recordset.RecordCount - 1
    Set_First_Pos
    Current_Oper = 0
    Fill_Form
    Del_Job.Enabled = True
    Pre_Job.Enabled = True
    Next_Job.Enabled = False
    Del_Oper.Enabled = False
    iJob_Name.SetFocus
End Sub


Private Sub Add_Oper_Click()
    Dat.job.Recordset.MoveLast
    Dat.job.Recordset.AbsolutePosition = Current_Job
    New_Process Dat.job.Recordset("job_number")
    Dat.job.Recordset.Edit
    Dat.job.Recordset("Process") = Dat.job.Recordset("Process") + 1
    Dat.job.Recordset.Update
    Current_Oper = Dat.job.Recordset("Process") - 1
    Process_LMove First_Pos + Current_Oper
    Fill_Form
    iOper_Name.Text = ""
    iMachine_Name.Text = ""
```

```
    iProcessing_Time.Text = 0
    Del_Oper.Enabled = True
    Pre_Oper.Enabled = True
    Next_Oper.Enabled = False
    iOper_Name.SetFocus
End Sub

Private Sub Del_Job_Click()
    For i = 1 To Dat.job.Recordset("process")
        Dat.process.Recordset.AbsolutePosition = First_Pos
        Dat.process.Recordset.Delete
        Dat.process.Refresh
        Dat.process.Recordset.MoveLast
    Next i
    Dat.job.Recordset.AbsolutePosition = Current_Job
    Dat.job.Recordset.Delete
    Dat.job.Refresh
    Dat.job.Recordset.MoveLast
    If Current_Job >= Dat.job.Recordset.RecordCount Then
        Current_Job = Current_Job - 1
    End If
    Set_First_Pos
    Current_Oper = 0
    If Dat.job.Recordset.RecordCount <= 1 Then
        Del_Job.Enabled = False
    End If
    If Current_Job < Dat.job.Recordset.RecordCount - 1 Then
        Next_Job.Enabled = True
    Else
        Next_Job.Enabled = False
    End If
    If Current_Job > 0 Then
        Pre_Job.Enabled = True
    Else
        Pre_Job.Enabled = False
    End If
    If Dat.job.Recordset("process") <= 1 Then
        Del_Oper.Enabled = False
        Next_Oper.Enabled = False
    Else
        Del_Oper.Enabled = True
        Next_Oper.Enabled = True
    End If
    Fill_Form
    Pre_Oper.Enabled = False
    iJob_Name.SetFocus
End Sub



Private Sub Del_Oper_Click()
    Dat.process.Recordset.MoveLast
```

```
    Dat.process.Recordset.AbsolutePosition = First_Pos + Current_Oper
    Dat.process.Recordset.Delete
    Dat.process.Refresh
    Dat.job.Recordset.MoveLast
    Dat.job.Recordset.AbsolutePosition = Current_Job
    Dat.job.Recordset.Edit
    Dat.job.Recordset("Process") = Dat.job.Recordset("Process") - 1
    Dat.job.Recordset.Update
    If Current_Oper > Dat.job.Recordset("Process") - 1 Then
       Current_Oper = Dat.job.Recordset("Process") - 1
    End If
    If Dat.job.Recordset("process") <= 1 Then
       Del_Oper.Enabled = False
    End If
    If Current_Oper >= Dat.job.Recordset("Process") - 1 Then
       Next_Oper.Enabled = False
    Else
       Next_Oper.Enabled = True
    End If
    If Current_Oper > 0 Then
       Pre_Oper.Enabled = True
    Else
       Pre_Oper.Enabled = False
    End If
    Fill_Form
    iOper_Name.SetFocus
End Sub

Private Sub Form_Initialize()
    Printer.PaperSize = vbPRPSA4
    If Len(App.Path) <= 3 Then
       Data_Pos = App.Path & "data.mdb"
       Temp_Pos = App.Path & "temp.mdb"
       Pro_Path = App.Path
    Else
       Data_Pos = App.Path & "\data.mdb"
       Temp_Pos = App.Path & "\temp.mdb"
       Pro_Path = App.Path & "\"
    End If
    Dat.Enabled = True
    Close_Data
    Edited = False
    Mc_Num = 1
    Mode = False
    Repeat = True
    Replace = False
    Can0
End Sub


Private Sub Form_Resize()
    If WindowState <> 1 Then
       If Main.Height < 5500 Then
          Main.Height = 5500
       End If
```

```
      If Main.Width < 8000 Then
         Main.Width = 8000
      End If
      Arrange_form
   End If
End Sub



Private Sub Form_Unload(Cancel As Integer)
   End
End Sub



Private Sub idue_date_Change()
   Edited = True
   Dat.job.Recordset.AbsolutePosition = Current_Job
   Dat.job.Recordset.Edit
   Dat.job.Recordset("due_date") = Val(idue_date.Text)
   Dat.job.Recordset.Update
   Job_Table.Fill_Table
End Sub

Private Sub idue_date_GotFocus()
   idue_date.SelStart = 0
   idue_date.SelLength = Len(idue_date.Text)
End Sub


Private Sub idue_date_KeyPress(KeyAscii As Integer)
   If KeyAscii = 13 Then
      iOper_Name.SetFocus
   End If
End Sub


Private Sub iJob_Name_Change()
   Edited = True
   Dat.job.Recordset.AbsolutePosition = Current_Job
   Dat.job.Recordset.Edit
   Dat.job.Recordset("job_name") = iJob_Name.Text
   Dat.job.Recordset.Update
   Job_Table.Fill_Table
End Sub

Private Sub iJob_Name_GotFocus()
   iJob_Name.SelStart = 0
   iJob_Name.SelLength = Len(iJob_Name.Text)
End Sub
```

```
Private Sub iJob_Name_KeyPress(KeyAscii As Integer)
    If KeyAscii = 13 Then
        idue_date.SetFocus
    End If
End Sub


Private Sub iMachine_Name_Change()
    Edited = True
    Dat.process.Recordset.AbsolutePosition = First_Pos + Current_Ope
    Dat.process.Recordset.Edit
    Dat.process.Recordset("machine_name") = iMachine_Name.Text
    Dat.process.Recordset.Update
    Job_Table.Fill_Table
End Sub

Private Sub iMachine_Name_GotFocus()
    iMachine_Name.SelStart = 0
    iMachine_Name.SelLength = Len(iMachine_Name.Text)
End Sub


Private Sub iMachine_Name_KeyPress(KeyAscii As Integer)
    If KeyAscii = 13 Then
        iProcessing_Time.SetFocus
    End If
End Sub


Private Sub Insert_Job_Click()
    New_Job
    Job_LMove Current_Job
    Set_First_Pos
    Process_LMove First_Pos
    Current_Oper = 0
    Fill_Form
    Del_Job.Enabled = True
    Next_Job.Enabled = True
    Del_Oper.Enabled = False
    iJob_Name.SetFocus
End Sub


Private Sub Insert_Oper_Click()
    Dat.job.Recordset.MoveLast
    Dat.job.Recordset.AbsolutePosition = Current_Job
    Dat.job.Recordset.Edit
    Dat.job.Recordset("Process") = Dat.job.Recordset("Process") + 1
    Dat.job.Recordset.Update
    New_Process Dat.job.Recordset("job_number")
    Process_LMove First_Pos + Current_Oper
    Fill_Form
    iOper_Name.Text = ""
    iMachine_Name.Text = ""
```

```
    iProcessing_Time.Text = 0
    Del_Oper.Enabled = True
    Next_Oper.Enabled = True
    iOper_Name.SetFocus
End Sub

Private Sub iOper_Name_Change()
    Edited = True
    Dat.process.Recordset.AbsolutePosition = First_Pos + Current_Oper
    Dat.process.Recordset.Edit
    Dat.process.Recordset("process_name") = iOper_Name.Text
    Dat.process.Recordset.Update
    Job_Table.Fill_Table
End Sub

Private Sub iOper_Name_GotFocus()
    iOper_Name.SelStart = 0
    iOper_Name.SelLength = Len(iOper_Name.Text)
End Sub


Private Sub iOper_Name_KeyPress(KeyAscii As Integer)
    If KeyAscii = 13 Then
        iMachine_Name.SetFocus
    End If
End Sub


Private Sub iProcessing_Time_Change()
    Edited = True
    Dat.process.Recordset.AbsolutePosition = First_Pos + Current_Oper
    Dat.process.Recordset.Edit
    If iProcessing_Time.Text = "" Then
        Dat.process.Recordset("processing_time") = 0
    Else
        Dat.process.Recordset("processing_time") = CDbl(Format(iProcessing_Time.Text, "000.00")
    End If
    Dat.process.Recordset.Update
    Job_Table.Fill_Table
End Sub

Private Sub iProcessing_Time_GotFocus()
    iProcessing_Time.SelStart = 0
    iProcessing_Time.SelLength = Len(iProcessing_Time.Text)
End Sub


Private Sub iProcessing_Time_KeyPress(KeyAscii As Integer)
    If KeyAscii = 13 Then
        Insert_Oper.SetFocus
    End If
End Sub


Private Sub iProcessing_Time_LostFocus()
```

```
    Dat.process.Recordset.AbsolutePosition = First_Pos + Current_Oper
    iProcessing_Time.Text = Format(Dat.process.Recordset("processing_time"), "###0.00")
End Sub

Private Sub mnuBDT_Click()
    Show_MachineBreak
End Sub

Private Sub mnuClose_Click()
    Dim cc As Boolean

    If Edited Then
        ans = MsgBox("Warning! Data have been modified. Do you want to save it?", vbYesNoCancel, "Warning")
        If ans = vbYes Then
            mnuSave_Click
            If Dat.job.Recordset.RecordCount > 1 Then
                cc = True
            End If
        ElseIf ans = vbCancel Then
            cc = False
        ElseIf ans = vbNo Then
            cc = True
        End If
    Else
        cc = True
    End If
    If cc Then
        Close_Data
        Edited = False
        Can0
        ShutWin
    End If
End Sub

Private Sub mnuEDD_Click()
    mnuSPT.Checked = False
    mnuEDD.Checked = True
    mnuSLACK.Checked = False
    mnuRANDOM.Checked = False
    mnuLPT.Checked = False
    mnuSDT.Checked = False
    mnuLDT.Checked = False
    mnuSMT.Checked = False
    mnuLMT.Checked = False
    mnuSlackTP.Checked = False
    C_Option.Show 1
End Sub

Private Sub mnuExit_Click()
    Dat.job.Recordset.Close
    Dat.process.Recordset.Close
    End
End Sub
```

```
Private Sub mnuInput_Click()
    R_Input.Enabled = True
    R_Input.Visible = True
    R_Input.SetFocus
End Sub

Private Sub mnuInputMR_Click()
    McReplace.Enabled = True
    McReplace.Fill_Table
    McReplace.Visible = True
    McReplace.SetFocus
End Sub

Private Sub mnuJob_Click()
    Show_JobChart
End Sub

Private Sub mnuLDT_Click()
    mnuSPT.Checked = False
    mnuEDD.Checked = False
    mnuSLACK.Checked = False
    mnuRANDOM.Checked = False
    mnuLPT.Checked = False
    mnuSDT.Checked = False
    mnuLDT.Checked = True
    mnuSMT.Checked = False
    mnuLMT.Checked = False
    mnuSlackTP.Checked = False
    C_Option.Show 1
End Sub

Private Sub mnuLMT_Click()
    mnuSPT.Checked = False
    mnuEDD.Checked = False
    mnuSLACK.Checked = False
    mnuRANDOM.Checked = False
    mnuLPT.Checked = False
    mnuSDT.Checked = False
    mnuLDT.Checked = False
    mnuSMT.Checked = False
    mnuLMT.Checked = True
    mnuSlackTP.Checked = False
    C_Option.Show 1
End Sub

Private Sub mnuLPT_Click()
    mnuSPT.Checked = False
    mnuEDD.Checked = False
    mnuSLACK.Checked = False
    mnuRANDOM.Checked = False
    mnuLPT.Checked = True
    mnuSDT.Checked = False
    mnuLDT.Checked = False
    mnuSMT.Checked = False
```

```
    mnuLMT.Checked = False
    mnuSlackTP.Checked = False
    C_Option.Show 1
End Sub

Private Sub mnuGrantChart_Click()
    Show_GanttChart
End Sub

Private Sub mnuNew_Click()
    If Edited Then
        ans = MsgBox("Warning! Data have been modified. Do you want to save it?", vbYesNoCancel, "Warning")
        If ans <> vbCancel Then
            If ans = vbYes Then
                mnuSave_Click
            End If
            New_Work
            Can1
        End If
    Else
        New_Work
        Can1
    End If
End Sub


Private Sub mnuNoRule_Click()
    mnuNoRule.Checked = True
    mnuredd.Checked = False
    mnurspt.Checked = False
    mnuRLPT.Checked = False
    mnuRSDT.Checked = False
    mnuRLDT.Checked = False
    mnuRSMT.Checked = False
    mnuRLMT.Checked = False
    mnuRSlack.Checked = False
    mnuRSlackTP.Checked = False
    mnuRRandom.Checked = False
    RChartName = "No Rule"
    mnuRG.Enabled = True
    Load ResOption
    ResOption.Visible = True
    ResOption.Enabled = True
    ResOption.SetFocus
End Sub

Private Sub mnuOpen_Click()
    Open_Dia.CancelError = True
    On Error GoTo EndOpen
    If Edited Then
        ans = MsgBox("Warning! Data have been modified. Do you want to save it?", vbYesNoCancel, "Warning"
        If ans = vbYes Then
            mnuSave_Click
            If Dat.job.Recordset.RecordCount > 1 Then
                Open_Dia.ShowOpen
```

```
            End If
        ElseIf ans = vbCancel Then
            Open_Dia.FileName = ""
        ElseIf ans = vbNo Then
            Open_Dia.ShowOpen
        End If
    Else
        Open_Dia.ShowOpen
    End If
    If Open_Dia.FileName <> "" Then
        Unload Dat
        FileCopy Open_Dia.FileName, Data_Pos
        Dat.Enabled = True
        Dat.job.Recordset.MoveLast
        Dat.job.Recordset.MoveFirst
        Dat.process.Recordset.MoveLast
        Dat.process.Recordset.MoveFirst
        First_Pos = 0
        Current_Job = 0
        Current_Oper = 0
        Show_Data
        Fill_Form
        Pre_Job.Enabled = False
        Pre_Oper.Enabled = False
        If Dat.job.Recordset.RecordCount <= 1 Then
            Del_Job.Enabled = False
            Next_Job.Enabled = False
        Else
            Del_Job.Enabled = True
            Next_Job.Enabled = True
        End If
        If Dat.job.Recordset("process") <= 1 Then
            Del_Oper.Enabled = False
            Next_Oper.Enabled = False
        Else
            Del_Oper.Enabled = True
            Next_Oper.Enabled = True
        End If
        FileName = Open_Dia.FileName
        Edited = False
        Can1
        ShutWin
    End If
EndOpen: Open_Dia.CancelError = False
End Sub

Private Sub mnuPJ_Click()
    Show_JobPerFormance
End Sub

Private Sub mnuPM_Click()
    Show_MachinePerFormance
End Sub

Private Sub mnuPrint_Click()
```

```
    Tprint.Enabled = True
    Tprint.Visible = True
    Tprint.SetFocus
End Sub

Private Sub mnuPU_Click()
    Show_TimeUtilization
End Sub

Private Sub mnuRANDOM_Click()
    mnuSPT.Checked = False
    mnuEDD.Checked = False
    mnuSLACK.Checked = False
    mnuRANDOM.Checked = True
    mnuLPT.Checked = False
    mnuSDT.Checked = False
    mnuLDT.Checked = False
    mnuSMT.Checked = False
    mnuLMT.Checked = False
    mnuSlackTP.Checked = False
    C_Option.Show 1
End Sub

Private Sub mnuRChart_Click()
    Show_RGanttChart
End Sub


Private Sub mnuRD_Click()
    Show_RescheduleTable
End Sub


Private Sub mnuREDD_Click()
    mnuNoRule.Checked = False
    mnuredd.Checked = True
    mnurspt.Checked = False
    mnuRLPT.Checked = False
    mnuRSDT.Checked = False
    mnuRLDT.Checked = False
    mnuRSMT.Checked = False
    mnuRLMT.Checked = False
    mnuRSlack.Checked = False
    mnuRSlackTP.Checked = False
    mnuRRandom.Checked = False
    RChartName = "EDD"
    mnuRG.Enabled = True
    Load ResOption
    ResOption.Visible = True
    ResOption.Enabled = True
    ResOption.SetFocus
End Sub


Private Sub mnuRG_Click()
```

```
    RPrepare
    Gen_RChart
    If Not (Reschedule) Then
        Main.Can3
    End If
End Sub


Private Sub mnuRJob_Click()
    Show_RJobChart
End Sub

Private Sub mnuRLDT_Click()
    mnuNoRule.Checked = False
    mnuredd.Checked = False
    mnurspt.Checked = False
    mnuRLPT.Checked = False
    mnuRSDT.Checked = False
    mnuRLDT.Checked = True
    mnuRSMT.Checked = False
    mnuRLMT.Checked = False
    mnuRSlack.Checked = False
    mnuRSlackTP.Checked = False
    mnuRRandom.Checked = False
    RChartName = "LDT"
    mnuRG.Enabled = True
    Load ResOption
    ResOption.Visible = True
    ResOption.Enabled = True
    ResOption.SetFocus
End Sub

Private Sub mnuRLMT_Click()
    mnuNoRule.Checked = False
    mnuredd.Checked = False
    mnurspt.Checked = False
    mnuRLPT.Checked = False
    mnuRSDT.Checked = False
    mnuRLDT.Checked = False
    mnuRSMT.Checked = False
    mnuRLMT.Checked = True
    mnuRSlack.Checked = False
    mnuRSlackTP.Checked = False
    mnuRRandom.Checked = False
    RChartName = "LMT"
    mnuRG.Enabled = True
    Load ResOption
    ResOption.Visible = True
    ResOption.Enabled = True
    ResOption.SetFocus
End Sub

Private Sub mnuRLPT_Click()
    mnuNoRule.Checked = False
    mnuredd.Checked = False
```

```
    mnurspt.Checked = False
    mnuRLPT.Checked = True
    mnuRSDT.Checked = False
    mnuRLDT.Checked = False
    mnuRSMT.Checked = False
    mnuRLMT.Checked = False
    mnuRSlack.Checked = False
    mnuRSlackTP.Checked = False
    mnuRRandom.Checked = False
    RChartName = "LPT"
    mnuRG.Enabled = True
    Load ResOption
    ResOption.Visible = True
    ResOption.Enabled = True
    ResOption.SetFocus
End Sub

Private Sub mnuRPerform_Click()
    Show_RJobPerFormance
End Sub

Private Sub mnuRPM_Click()
    Show_RMachinePerFormance
End Sub



Private Sub mnuRPU_Click()
    Show_RTimeUtilization
End Sub

Private Sub mnuRRandom_Click()
    mnuNoRule.Checked = False
    mnuredd.Checked = False
    mnurspt.Checked = False
    mnuRLPT.Checked = False
    mnuRSDT.Checked = False
    mnuRLDT.Checked = False
    mnuRSMT.Checked = False
    mnuRLMT.Checked = False
    mnuRSlack.Checked = False
    mnuRSlackTP.Checked = False
    mnuRRandom.Checked = True
    RChartName = "RANDOM"
    mnuRG.Enabled = True
    Load ResOption
    ResOption.Visible = True
    ResOption.Enabled = True
    ResOption.SetFocus
End Sub

Private Sub mnuRSDT_Click()
    mnuNoRule.Checked = False
    mnuredd.Checked = False
    mnurspt.Checked = False
```

```
    mnuRLPT.Checked = False
    mnuRSDT.Checked = True
    mnuRLDT.Checked = False
    mnuRSMT.Checked = False
    mnuRLMT.Checked = False
    mnuRSlack.Checked = False
    mnuRSlackTP.Checked = False
    mnuRRandom.Checked = False
    RChartName = "SDT"
    mnuRG.Enabled = True
    Load ResOption
    ResOption.Visible = True
    ResOption.Enabled = True
    ResOption.SetFocus
End Sub

Private Sub mnuRSlack_Click()
    mnuNoRule.Checked = False
    mnuredd.Checked = False
    mnurspt.Checked = False
    mnuRLPT.Checked = False
    mnuRSDT.Checked = False
    mnuRLDT.Checked = False
    mnuRSMT.Checked = False
    mnuRLMT.Checked = False
    mnuRSlack.Checked = True
    mnuRSlackTP.Checked = False
    mnuRRandom.Checked = False
    RChartName = "SLACK"
    mnuRG.Enabled = True
    Load ResOption
    ResOption.Visible = True
    ResOption.Enabled = True
    ResOption.SetFocus
End Sub

Private Sub mnuRSlackTP_Click()
    mnuNoRule.Checked = False
    mnuredd.Checked = False
    mnurspt.Checked = False
    mnuRLPT.Checked = False
    mnuRSDT.Checked = False
    mnuRLDT.Checked = False
    mnuRSMT.Checked = False
    mnuRLMT.Checked = False
    mnuRSlack.Checked = False
    mnuRSlackTP.Checked = True
    mnuRRandom.Checked = False
    RChartName = "SLACK/TP"
    mnuRG.Enabled = True
    Load ResOption
    ResOption.Visible = True
    ResOption.Enabled = True
    ResOption.SetFocus
End Sub
```

```
Private Sub mnuRSMT_Click()
    mnuNoRule.Checked = False
    mnuredd.Checked = False
    mnurspt.Checked = False
    mnuRLPT.Checked = False
    mnuRSDT.Checked = False
    mnuRLDT.Checked = False
    mnuRSMT.Checked = True
    mnuRLMT.Checked = False
    mnuRSlack.Checked = False
    mnuRSlackTP.Checked = False
    mnuRRandom.Checked = False
    RChartName = "SMT"
    mnuRG.Enabled = True
    Load ResOption
    ResOption.Visible = True
    ResOption.Enabled = True
    ResOption.SetFocus
End Sub

Private Sub mnuRSPT_Click()
    mnuNoRule.Checked = False
    mnuredd.Checked = False
    mnurspt.Checked = True
    mnuRLPT.Checked = False
    mnuRSDT.Checked = False
    mnuRLDT.Checked = False
    mnuRSMT.Checked = False
    mnuRLMT.Checked = False
    mnuRSlack.Checked = False
    mnuRSlackTP.Checked = False
    mnuRRandom.Checked = False
    RChartName = "SPT"
    mnuRG.Enabled = True
    Load ResOption
    ResOption.Visible = True
    ResOption.Enabled = True
    ResOption.SetFocus
End Sub

Private Sub mnuRTM_Click()
    Show_RescheouleMachineTable
End Sub

Private Sub mnuS_Click()
    Show_ScheduleTable
End Sub

Private Sub mnuSave_Click()
    Dim temp1, temp2 As Integer

    Save_Dia.CancelError = True
    On Error GoTo EndSave
```

```
    tDir = App.Path & "\data.mdb"
    If Dat.job.Recordset.RecordCount > 1 Then
        If FileName = "" Then
            Save_Dia.ShowSave
            If Save_Dia.FileName <> "" Then
                temp1 = Dat.job.Recordset.AbsolutePosition
                temp2 = Dat.process.Recordset.AbsolutePosition
                Unload Dat
                FileCopy tDir, Save_Dia.FileName
                Dat.Enabled = True
                FileName = Save_Dia.FileName
                Edited = False
                Dat.job.Recordset.MoveLast
                Dat.process.Recordset.MoveLast
                Dat.job.Recordset.AbsolutePosition = temp1
                Dat.process.Recordset.AbsolutePosition = temp2
            End If
        Else
            temp1 = Dat.job.Recordset.AbsolutePosition
            temp2 = Dat.process.Recordset.AbsolutePosition
            Unload Dat
            FileCopy tDir, FileName
            Dat.Enabled = True
            Edited = False
            Dat.job.Recordset.MoveLast
            Dat.process.Recordset.MoveLast
            Dat.job.Recordset.AbsolutePosition = temp1
            Dat.process.Recordset.AbsolutePosition = temp2
        End If
    Else
        temp = MsgBox("Error! Job is less than 2", vbOKOnly, "Error")
    End If
EndSave: Save_Dia.CancelError = False
End Sub

Private Sub mnuSaveas_Click()
    Dim temp1, temp2 As Integer

    Save_Dia.CancelError = True
    On Error GoTo EndSaveAs
    If Dat.job.Recordset.RecordCount > 1 Then
        Save_Dia.ShowSave
        If Save_Dia.FileName <> "" Then
            temp1 = Dat.job.Recordset.AbsolutePosition
            temp2 = Dat.process.Recordset.AbsolutePosition
            Unload Dat
            FileCopy Data_Pos, Save_Dia.FileName
            Dat.Enabled = True
            FileName = Save_Dia.FileName
            Edited = False
            Dat.job.Recordset.MoveLast
            Dat.process.Recordset.MoveLast
            Dat.job.Recordset.AbsolutePosition = temp1
            Dat.process.Recordset.AbsolutePosition = temp2
        End If
```

```
    Else
        temp = MsgBox("Error! Job is less than 2", vbOKOnly, "Error")
    End If
EndSaveAs: Save_Dia.CancelError = False
End Sub


Private Sub mnuSDT_Click()
    mnuSPT.Checked = False
    mnuEDD.Checked = False
    mnuSLACK.Checked = False
    mnuRANDOM.Checked = False
    mnuLPT.Checked = False
    mnuSDT.Checked = True
    mnuLDT.Checked = False
    mnuSMT.Checked = False
    mnuLMT.Checked = False
    mnuSlackTP.Checked = False
    C_Option.Show 1
End Sub

Private Sub mnuSLACK_Click()
    mnuSPT.Checked = False
    mnuEDD.Checked = False
    mnuSLACK.Checked = True
    mnuRANDOM.Checked = False
    mnuLPT.Checked = False
    mnuSDT.Checked = False
    mnuLDT.Checked = False
    mnuSMT.Checked = False
    mnuLMT.Checked = False
    mnuSlackTP.Checked = False
    C_Option.Show 1
End Sub

Private Sub mnuSlackTP_Click()
    mnuSPT.Checked = False
    mnuEDD.Checked = False
    mnuSLACK.Checked = False
    mnuRANDOM.Checked = False
    mnuLPT.Checked = False
    mnuSDT.Checked = False
    mnuLDT.Checked = False
    mnuSMT.Checked = False
    mnuLMT.Checked = False
    mnuSlackTP.Checked = True
    C_Option.Show 1
End Sub

Private Sub mnuSMT_Click()
    mnuSPT.Checked = False
    mnuEDD.Checked = False
    mnuSLACK.Checked = False
    mnuRANDOM.Checked = False
    mnuLPT.Checked = False
```

```
    mnuSDT.Checked = False
    mnuLDT.Checked = False
    mnuSMT.Checked = True
    mnuLMT.Checked = False
    mnuSlackTP.Checked = False
    C_Option.Show 1
End Sub

Private Sub mnuSPT_Click()
    mnuSPT.Checked = True
    mnuEDD.Checked = False
    mnuSLACK.Checked = False
    mnuRANDOM.Checked = False
    mnuLPT.Checked = False
    mnuSDT.Checked = False
    mnuLDT.Checked = False
    mnuSMT.Checked = False
    mnuLMT.Checked = False
    mnuSlackTP.Checked = False
    C_Option.Show 1
End Sub

Private Sub mnuTable_Click()
    Show_JobTable
End Sub

Private Sub mnuTM_Click()
    Show_MachineTable
End Sub

Private Sub Next_Job_Click()
    Current_Job = Current_Job + 1
    Set_First_Pos
    Current_Oper = 0
    Fill_Form
    Dat.job.Recordset.AbsolutePosition = Current_Job
    If Dat.job.Recordset("process") <= 1 Then
        Del_Oper.Enabled = False
        Next_Oper.Enabled = False
    Else
        Del_Oper.Enabled = True
        Next_Oper.Enabled = True
    End If
    Pre_Job.Enabled = True
    If Dat.job.Recordset.AbsolutePosition < Dat.job.Recordset.RecordCount - 1 Then
        Next_Job.Enabled = True
    Else
        Next_Job.Enabled = False
    End If
    Pre_Oper.Enabled = False
    iJob_Name.SetFocus
End Sub

Private Sub Next_Oper_Click()
    Current_Oper = Current_Oper + 1
```

```
    Fill_Form
    Dat.job.Recordset.AbsolutePosition = Current_Job
    Pre_Oper.Enabled = True
    If Current_Oper < Dat.job.Recordset("process") - 1 Then
        Next_Oper.Enabled = True
    Else
        Next_Oper.Enabled = False
    End If
    iOper_Name.SetFocus
End Sub


Private Sub Pre_Job_Click()
    Current_Job = Current_Job - 1
    Set_First_Pos
    Current_Oper = 0
    Fill_Form
    Dat.job.Recordset.AbsolutePosition = Current_Job
    Next_Job.Enabled = True
    If Current_Job > 0 Then
        Pre_Job.Enabled = True
    Else
        Pre_Job.Enabled = False
    End If
    If Dat.job.Recordset("process") <= 1 Then
        Del_Oper.Enabled = False
        Next_Oper.Enabled = False
    Else
        Del_Oper.Enabled = True
        Next_Oper.Enabled = True
    End If
    Pre_Oper.Enabled = False
    iJob_Name.SetFocus
End Sub

Private Sub Pre_Oper_Click()
    Current_Oper = Current_Oper - 1
    Fill_Form
    Next_Oper.Enabled = True
    If Current_Oper > 0 Then
        Pre_Oper.Enabled = True
    Else
        Pre_Oper.Enabled = False
    End If
    iOper_Name.SetFocus
End Sub
```

```
VERSION 4.00
Begin VB.Form McReplace
   Caption        =  "Machine Replacing Table"
   ClientHeight   =  4590
   ClientLeft     =  2115
   ClientTop      =  2265
   ClientWidth    =  5625
   Height         =  4995
   Left           =  2055
   LinkTopic      =  "Form1"
   ScaleHeight    =  4590
   ScaleWidth     =  5625
   Top            =  1920
   Width          =  5745
   Begin VB.VScrollBar Scroll
      Height         =  3255
      Left           =  5280
      TabIndex       =  7
      Top            =  480
      Visible        =  0   'False
      Width          =  255
   End
   Begin VB.ComboBox Box
      Height         =  330
      Left           =  1680
      TabIndex       =  6
      Top            =  3240
      Visible        =  0   'False
      Width          =  1575
   End
   Begin VB.CommandButton Ok
      Caption        =  "&Close"
      Height         =  405
      Left           =  2160
      TabIndex       =  0
      Top            =  4080
      Width          =  1335
   End
   Begin MSGrid.Grid Data
      Height         =  1935
      Left           =  120
      TabIndex       =  4
      Top            =  600
      Width          =  3615
      _Version       =  65536
      _ExtentX       =  6376
      _ExtentY       =  3413
      _StockProps    =  77
      BackColor      =  16777215
      BeginProperty Font {0BE35203-8F91-11CE-9DE3-00AA004BB851}
         name           =  "MS Sans Serif"
         charset        =  222
         weight         =  700
         size           =  9.75
         underline      =  0   'False
```

```
    italic          =  0   'False
    strikethrough   =  0   'False
  EndProperty
  BorderStyle     =  0
  Rows            =  1
  Cols            =  3
  FixedRows       =  0
  FixedCols       =  0
  ScrollBars      =  0
End
Begin VB.Label Label3
  Alignment       =  2  'Center
  BackColor       =  &H00808080&
  BorderStyle     =  1  'Fixed Single
  Caption         =  "Alternative Machine"
  BeginProperty Font
    name            =  "MS Sans Serif"
    charset         =  222
    weight          =  700
    size            =  8.25
    underline       =  0   'False
    italic          =  0   'False
    strikethrough   =  0   'False
  EndProperty
  Height          =  255
  Left            =  2520
  TabIndex        =  3
  Top             =  0
  Width           =  2055
End
Begin VB.Label Label2
  Alignment       =  2  'Center
  BackColor       =  &H00808080&
  BorderStyle     =  1  'Fixed Single
  Caption         =  "Machine Name"
  BeginProperty Font
    name            =  "MS Sans Serif"
    charset         =  222
    weight          =  700
    size            =  8.25
    underline       =  0   'False
    italic          =  0   'False
    strikethrough   =  0   'False
  EndProperty
  Height          =  255
  Left            =  720
  TabIndex        =  2
  Top             =  0
  Width           =  1695
End
Begin VB.Label Label1
  Alignment       =  2  'Center
  BackColor       =  &H00808080&
  BorderStyle     =  1  'Fixed Single
  Caption         =  "No."
```

```
    BeginProperty Font
      name            =  "MS Sans Serif"
      charset         =  222
      weight          =  700
      size            =  8.25
      underline       =  0   'False
      italic          =  0   'False
      strikethrough   =  0   'False
    EndProperty
    Height          =  255
    Left            =  0
    TabIndex        =  1
    Top             =  0
    Width           =  615
  End
  Begin VB.Label Border
    BorderStyle     =  1  'Fixed Single
    Height          =  3255
    Left            =  0
    TabIndex        =  5
    Top             =  480
    Width           =  5175
  End
End
Attribute VB_Name = "McReplace"
Attribute VB_Creatable = False
Attribute VB_Exposed = False
Sub Fill_Table()
   Data.ColAlignment(0) = 1
   Data.ColAlignment(1) = 0
   Data.ColAlignment(2) = 0
   Data.Rows = Dat.machine.Recordset.RecordCount
   Dat.machine.Recordset.MoveLast
   For i = 0 To Dat.machine.Recordset.RecordCount - 1
      Dat.machine.Recordset.AbsolutePosition = i
      Data.Row = i
      Data.Col = 0
      Data.Text = i + 1
      Data.Col = 1
      Data.Text = Dat.machine.Recordset("machine_name")
      Data.Col = 2
      If Dat.machine.Recordset("replace") <> 0 Then
         Dat.machine.Recordset.AbsolutePosition = Dat.machine.Recordset("replace") - 1
         Data.Text = Dat.machine.Recordset("machine_name")
      Else
         Data.Text = ""
      End If
   Next i
End Sub


Sub Arrange_form()
   Border.Left = 90
   Border.Top = 300
   Border.Width = McReplace.Width - 320
```

```
    Border.Height = McReplace.Height - 1200
    Ok.Left = Int((McReplace.Width - Ok.Width) / 2)
    Ok.Top = McReplace.Height - 820
    If Data.Height > (Data.RowHeight(0) + 15) * Data.Rows Then
        Scroll.Visible = False
        Data.Left = Border.Left + 40
        Data.Top = Border.Top + 40
        Data.Width = Border.Width - 80
        Data.Height = Border.Height - 80
        Label1.Top = 10
        Label1.Width = 600
        Label1.Left = Border.Left
        Label2.Top = Label1.Top
        Label2.Width = Int((Border.Width - Label1.Width) * 0.5)
        Label2.Left = Label1.Left + Label1.Width + 10
        temp = Border.Width - Label1.Width - Label2.Width - 20
        Label3.Top = Label1.Top
        Label3.Width = temp
        Label3.Left = Label2.Left + Label2.Width + 10
        Data.ColWidth(0) = Label1.Width - 40
        Data.ColWidth(1) = Label2.Width
        Data.ColWidth(2) = Label3.Width - 60
    Else
        Data.Left = Border.Left + 40
        Data.Top = Border.Top + 40
        Data.Width = Border.Width - 280
        Data.Height = Border.Height - 80
        Scroll.Visible = True
        Scroll.Top = Data.Top
        Scroll.Left = Data.Left + Data.Width - 80
        Scroll.Height = Data.Height
        Scroll.Width = Border.Width - Data.Width
        Scroll.Max = Data.Rows - Int(Data.Height / Data.RowHeight(0))
        Label1.Top = 10
        Label1.Width = 600
        Label1.Left = Border.Left
        Label2.Top = Label1.Top
        Label2.Width = Int((Border.Width - Label1.Width - 300) * 0.5)
        Label2.Left = Label1.Left + Label1.Width + 10
        temp = Border.Width - Label1.Width - Label2.Width - 320
        Label3.Top = Label1.Top
        Label3.Width = temp
        Label3.Left = Label2.Left + Label2.Width + 10
        Data.ColWidth(0) = Label1.Width - 40
        Data.ColWidth(1) = Label2.Width
        Data.ColWidth(2) = Label3.Width - 60
    End If
End Sub

Private Sub box_Click()
    Data.Col = 2
    Data.Row = Data.SelStartRow
    Dat.machine.Recordset.AbsolutePosition = Data.Row
    Dat.machine.Recordset.Edit
    If box.ListIndex = Data.SelStartRow + 1 Then
```

```
        Data.Text = ""
        Dat.machine.Recordset("replace") = 0
    Else
        Data.Text = box.Text
        Dat.machine.Recordset("replace") = box.ListIndex
    End If
    Dat.machine.Recordset.Update
    box.Visible = False
End Sub

Private Sub box_KeyPress(KeyAscii As Integer)
    If KeyAscii = 13 Then
        Data.Col = 2
        Data.Row = Data.SelStartRow
        Dat.machine.Recordset.AbsolutePosition = Data.Row
        Dat.machine.Recordset.Edit
        If box.ListIndex = Data.SelStartRow + 1 Then
            Data.Text = ""
            Dat.machine.Recordset("replace") = 0
        Else
            Data.Text = box.Text
            Dat.machine.Recordset("replace") = box.ListIndex
        End If
        Dat.machine.Recordset.Update
        box.Visible = False
    End If
End Sub


Private Sub box_LostFocus()
    box.Visible = False
End Sub

Private Sub Data_Click()
    If Data.SelStartCol = 2 Then
        If (Data.SelStartRow - Data.TopRow + 1) * (Data.RowHeight(0) + 15) > Data.Height Then
            Data.TopRow = Data.TopRow + 1
        End If
        box.Top = Data.Top + (Data.SelStartRow - Data.TopRow) * (Data.RowHeight(0) + 15) - 20)
        box.Left = Data.Left + Data.ColWidth(0) + Data.ColWidth(1)
        box.Width = Data.ColWidth(2) + 50
        box.Visible = True
    End If
End Sub

Private Sub Data_KeyPress(KeyAscii As Integer)
    If KeyAscii = 13 Then
        If Data.SelStartCol = 2 Then
            If (Data.SelStartRow - Data.TopRow + 1) * (Data.RowHeight(0) + 15) > Data.Height Then
                Data.TopRow = Data.TopRow + 1
            End If
            box.Top = Data.Top + (Data.SelStartRow - Data.TopRow) * (Data.RowHeight(0) + 15) - 20
            box.Left = Data.Left + Data.ColWidth(0) + Data.ColWidth(1)
            box.Width = Data.ColWidth(2) + 50
            box.Visible = True
```

```
        End If
    End If
End Sub


Private Sub Data_RowColChange()
    box.Visible = False
    Scroll.Value = Data.TopRow
End Sub


Private Sub Form_Activate()
    Arrange_form
    box.Clear
    box.AddItem ""
    For i = 0 To Dat.machine.Recordset.RecordCount - 1
        Dat.machine.Recordset.AbsolutePosition = i
        box.AddItem Dat.machine.Recordset("machine_name")
    Next i
End Sub

Private Sub Form_Resize()
    If McReplace.WindowState <> 1 Then
        If McReplace.Width < 6000 Then McReplace.Width = 6000
        If McReplace.Height < 2500 Then McReplace.Height = 2500
        box.Visible = False
        Arrange_form
    End If
End Sub

Private Sub Form_Unload(Cancel As Integer)
    McReplace.Enabled = False
    McReplace.Visible = False
    Unload McReplace
    Main.Enabled = True
    Main.Visible = True
    Main.SetFocus
End Sub

Private Sub Ok_Click()
    McReplace.Enabled = False
    McReplace.Visible = False
    Unload McReplace
    Main.Enabled = True
    Main.Visible = True
    Main.SetFocus
End Sub

Private Sub Scroll_Change()
    box.Visible = False
    Data.TopRow = Scroll.Value
End Sub
```

```
VERSION 4.00
Begin VB.Form McTable
   Caption         =  "Scheduling Machine Utilization"
   ClientHeight    =  5385
   ClientLeft      =  1260
   ClientTop       =  1965
   ClientWidth     =  7260
   BeginProperty Font
      name         =  "MS Sans Serif"
      charset      =  222
      weight       =  700
      size         =  8.25
      underline    =  0   'False
      italic       =  0   'False
      strikethrough =  0   'False
   EndProperty
   Height          =  5790
   Left            =  1200
   LinkTopic       =  "Form1"
   ScaleHeight     =  5385
   ScaleWidth      =  7260
   Top             =  1620
   Width           =  7380
   Begin VB.CommandButton Ok
      Caption      =  "&Close"
      Height       =  405
      Left         =  3240
      TabIndex     =  0
      Top          =  4800
      Width        =  1335
   End
   Begin VB.Label Label1
      Alignment    =  2  'Center
      BackColor    =  &H00808080&
      BorderStyle  =  1  'Fixed Single
      Caption      =  "No."
      Height       =  255
      Left         =  0
      TabIndex     =  5
      Top          =  0
      Width        =  615
   End
   Begin VB.Label Label2
      Alignment    =  2  'Center
      BackColor    =  &H00808080&
      BorderStyle  =  1  'Fixed Single
      Caption      =  "Machine Name"
      Height       =  255
      Left         =  720
      TabIndex     =  4
      Top          =  0
      Width        =  1695
   End
   Begin VB.Label Label3
      Alignment    =  2  'Center
```

```
    BackColor       =   &H008080808&
    BorderStyle     =   1  'Fixed Single
    Caption         =   "Utilization"
    Height          =   255
    Left            =   2520
    TabIndex        =   3
    Top             =   0
    Width           =   1335
  End
  Begin MSGrid.Grid Data
    Height          =   1935
    Left            =   120
    TabIndex        =   1
    Top             =   600
    Width           =   5295
    _Version        =   65536
    _ExtentX        =   9340
    _ExtentY        =   3413
    _StockProps     =   77
    BackColor       =   16777215
    BorderStyle     =   0
    Rows            =   1
    Cols            =   3
    FixedRows       =   0
    FixedCols       =   0
    ScrollBars      =   2
  End
  Begin VB.Label Border
    BorderStyle     =   1  'Fixed Single
    Height          =   3255
    Left            =   0
    TabIndex        =   2
    Top             =   480
    Width           =   7215
  End
End
Attribute VB_Name = "McTable"
Attribute VB_Creatable = False
Attribute VB_Exposed = False

Sub Arrange_form()
    Border.Left = 90
    Border.Top = 300
    Border.Width = McTable.Width - 320
    Border.Height = McTable.Height - 1200
    Data.Left = Border.Left + 40
    Data.Top = Border.Top + 40
    Data.Width = Border.Width - 80
    Data.Height = Border.Height - 80
    Ok.Left = Int((McTable.Width - Ok.Width) / 2)
    Ok.Top = McTable.Height - 820
    If Data.Height > (Data.RowHeight(0) + 15) * Data.Rows Then
       Label1.Top = 10
       Label1.Width = 600
       Label1.Left = Border.Left
```

```
        Label2.Top = Label1.Top
        Label2.Width = Int((Border.Width - Label1.Width) * 0.5)
        Label2.Left = Label1.Left + Label1.Width + 10
        temp = Border.Width - Label1.Width - Label2.Width - 20
        Label3.Top = Label1.Top
        Label3.Width = temp
        Label3.Left = Label2.Left + Label2.Width + 10
        Data.ColWidth(0) = Label1.Width - 40
        Data.ColWidth(1) = Label2.Width
        Data.ColWidth(2) = Label3.Width - 50
    Else
        Label1.Top = 10
        Label1.Width = 600
        Label1.Left = Border.Left
        Label2.Top = Label1.Top
        Label2.Width = Int((Border.Width - Label1.Width - 300) * 0.5)
        Label2.Left = Label1.Left + Label1.Width + 10
        temp = Border.Width - Label1.Width - Label2.Width - 320
        Label3.Top = Label1.Top
        Label3.Width = temp
        Label3.Left = Label2.Left + Label2.Width + 10
        Data.ColWidth(0) = Label1.Width - 40
        Data.ColWidth(1) = Label2.Width
        Data.ColWidth(2) = Label3.Width - 50
    End If

End Sub
Sub Fill_Table()
    Dim util As Double
    Data.ColAlignment(0) = 1
    Data.ColAlignment(1) = 0
    Data.ColAlignment(2) = 1
    Data.Rows = Dat.machine.Recordset.RecordCount + 1
    Dat.machine.Recordset.MoveLast
    util = 0
    For i = 0 To Dat.machine.Recordset.RecordCount - 1
        Dat.machine.Recordset.AbsolutePosition = i
        Data.Row = i
        Data.Col = 0
        Data.Text = i + 1
        Data.Col = 1
        Data.Text = Dat.machine.Recordset("machine_name")
        Data.Col = 2
        Data.Text = Format(Dat.machine.Recordset("utilization"), "#,##0.00")
        util = util + Dat.machine.Recordset("utilization")
    Next i
    Data.Row = Dat.machine.Recordset.RecordCount
    Data.Col = 0
    Data.Text = ""
    Data.Col = 1
    Data.Text = "Average"
    Data.Col = 2
    Data.Text = Format(util / Dat.machine.Recordset.RecordCount, "##0.00")
End Sub
```

```
Private Sub Form_Activate()
    Arrange_form
End Sub

Private Sub Form_Resize()
    If McTable.WindowState <> 1 Then
        If McTable.Width < 5500 Then McTable.Width = 5500
        If McTable.Height < 2500 Then McTable.Height = 2500
        Arrange_form
    End If
End Sub


Private Sub Form_Unload(Cancel As Integer)
    McTable.Enabled = False
    McTable.Visible = False
    Unload McTable
    Main.Enabled = True
    Main.Visible = True
    Main.SetFocus
End Sub


Private Sub Ok_Click()
    McTable.Enabled = False
    McTable.Visible = False
    Unload McTable
    Main.Enabled = True
    Main.Visible = True
    Main.SetFocus
End Sub
```

```
VERSION 4.00
Begin VB.Form C_Option
   BorderStyle     =  1  'Fixed Single
   Caption         =  "Scheduling Generation Option"
   ClientHeight    =  3105
   ClientLeft      =  2790
   ClientTop       =  2685
   ClientWidth     =  4980
   Height          =  3510
   Left            =  2730
   LinkTopic       =  "Form1"
   MaxButton       =  0  'False
   MinButton       =  0  'False
   ScaleHeight     =  3105
   ScaleWidth      =  4980
   Top             =  2340
   Width           =  5100
   Begin VB.CommandButton Cancel
      Caption         =  "&Cancel"
      BeginProperty Font
         name            =  "MS Sans Serif"
         charset         =  222
         weight          =  700
         size            =  8.25
         underline       =  0  'False
         italic          =  0  'False
         strikethrough   =  0  'False
      EndProperty
      Height          =  375
      Left            =  2760
      TabIndex        =  3
      Top             =  2640
      Width           =  1455
   End
   Begin VB.CommandButton Ok
      Caption         =  "&Ok"
      BeginProperty Font
         name            =  "MS Sans Serif"
         charset         =  222
         weight          =  700
         size            =  8.25
         underline       =  0  'False
         italic          =  0  'False
         strikethrough   =  0  'False
      EndProperty
      Height          =  375
      Left            =  720
      TabIndex        =  2
      Top             =  2640
      Width           =  1455
   End
   Begin VB.Frame Frame1
      Caption         =  "Options"
      BeginProperty Font
         name            =  "MS Sans Serif"
```

```
      charset        = 222
      weight         = 700
      size           = 8.25
      underline      = 0   'False
      italic         = 0   'False
      strikethrough  = 0   'False
    EndProperty
    Height         = 2055
    Left           = 720
    TabIndex       = 4
    Top            = 240
    Width          = 3495
    Begin VB.OptionButton NoDelay
      Caption        = "Non Delay"
      BeginProperty Font
        name           = "MS Sans Serif"
        charset        = 222
        weight         = 700
        size           = 8.25
        underline      = 0   'False
        italic         = 0   'False
        strikethrough  = 0   'False
      EndProperty
      Height         = 375
      Left           = 1080
      TabIndex       = 1
      Top            = 1320
      Width          = 1335
    End
    Begin VB.OptionButton Active
      Caption        = "Active"
      BeginProperty Font
        name           = "MS Sans Serif"
        charset        = 222
        weight         = 700
        size           = 8.25
        underline      = 0   'False
        italic         = 0   'False
        strikethrough  = 0   'False
      EndProperty
      Height         = 375
      HelpContextID  = 3
      Left           = 1080
      TabIndex       = 0
      Top            = 480
      Value          = -1  'True
      Width          = 1335
    End
  End
End
Attribute VB_Name = "C_Option"
Attribute VB_Creatable = False
Attribute VB_Exposed = False

Private Sub Cancel_Click()
```

```
    C_Option.Enabled = False
    C_Option.Visible = False
    Unload C_Option
    Main.SetFocus
End Sub

Private Sub Form_Load()
    If Mode Then
        Active.Value = True
        NoDelay.Value = False
    Else
        Active.Value = False
        NoDelay.Value = True
    End If
End Sub

Private Sub Ok_Click()
    Randomize
    If Active.Value Then
        Mode = True
    Else
        Mode = False
    End If
    C_Option.Enabled = False
    C_Option.Visible = False
    Unload C_Option
    GenChart.Enabled = True
    GenChart.Visible = True
    GenChart.SetFocus
    GenChart.Generate
    Main.SetFocus
    If Reschedule Then
        RPrepare
        Gen_RChart
    Else
        Main.Can2
    End If
    TimeUtilization.Output
    ScheduleTable.Fill_Table
    JobTable.Fill_Table
    Chart.Arrange_form
    JobChart.Arrange_form
    Table.Fill_Table
    McTable.Fill_Table
End Sub
```

```
VERSION 4.00
Begin VB.Form R_Input
   BorderStyle     =  1  'Fixed Single
   Caption         =  "Input Breakdown Machine"
   ClientHeight    =  1755
   ClientLeft      =  3165
   ClientTop       =  3285
   ClientWidth     =  3780
   BeginProperty Font
      name           =  "MS Sans Serif"
      charset        =  222
      weight         =  700
      size           =  8.25
      underline      =  0   'False
      italic         =  0   'False
      strikethrough  =  0   'False
   EndProperty
   Height          =  2160
   Left            =  3105
   LinkTopic       =  "Form1"
   MaxButton       =  0   'False
   MinButton       =  0   'False
   ScaleHeight     =  1755
   ScaleWidth      =  3780
   Top             =  2940
   Width           =  3900
   Begin VB.CommandButton Cancel
      Caption         =  "&Cancel"
      Height          =  375
      Left            =  2040
      TabIndex        =  3
      Top             =  1200
      Width           =  1335
   End
   Begin VB.CommandButton Generate
      Caption         =  "&Generate"
      Height          =  375
      Left            =  480
      TabIndex        =  2
      Top             =  1200
      Width           =  1335
   End
   Begin VB.TextBox Data
      Height          =  375
      Left            =  600
      TabIndex        =  1
      Top             =  600
      Width           =  2655
   End
   Begin VB.Label Label1
      AutoSize        =  -1  'True
      Caption         =  "How many  machines are breaking down ?"
      Height          =  195
      Left            =  120
      TabIndex        =  0
```

```
    Top             =   240
    Width           =   3585
  End
End
Attribute VB_Name = "R_Input"
Attribute VB_Creatable = False
Attribute VB_Exposed = False

Private Sub Cancel_Click()
   R_Input.Enabled = False
   R_Input.Visible = False
   Unload R_Input
   Main.SetFocus
End Sub

Private Sub Data_Change()
   Mc_Num = Val(Data.Text)
End Sub

Private Sub Data_GotFocus()
   Data.SelStart = 0
   Data.SelLength = Len(Data.Text)
End Sub


Private Sub Data_KeyPress(KeyAscii As Integer)
   If KeyAscii = 13 Then
      Generate.SetFocus
   End If
End Sub


Private Sub Form_Initialize()
   Data.Text = Mc_Num
End Sub

Private Sub Generate_Click()
   Randomize
   Dat.machine.Recordset.MoveLast
   For i = 0 To Dat.machine.Recordset.RecordCount - 1
      Dat.machine.Recordset.AbsolutePosition = i
      Dat.machine.Recordset.Edit
      Dat.machine.Recordset("b_start") = 0
      Dat.machine.Recordset("b_stop") = 0
      Dat.machine.Recordset.Update
   Next i
   Number = Mc_Num
   If Number > Dat.machine.Recordset.RecordCount Then
      Number = Dat.machine.Recordset.RecordCount
   End If
   For i = 1 To Number
      not_found = True
      While not_found
         temp = Int(Rnd * Dat.machine.Recordset.RecordCount)
         Dat.machine.Recordset.AbsolutePosition = temp
```

```
            If Dat.machine.Recordset("b_stop") = 0 Then
               not_found = False
               Dat.machine.Recordset.Edit
               temp = CDbl(Format(Rnd * 0.7 * Max_Time, "##0.00"))
               Dat.machine.Recordset("b_start") = temp
               Dat.machine.Recordset("b_stop") = temp + CDbl(Format(Rnd * 0.1 * Max_Time + 1, "##0.00"))
               Dat.machine.Recordset.Update
            End If
         Wend
      Next i
      Show_MachineBreak
      R_Input.Enabled = False
      R_Input.Visible = False
      Unload R_Input
      MachineBreak.SetFocus
End Sub
```

```
VERSION 4.00
Begin VB.Form RChart
   AutoRedraw      =  -1  'True
   Caption         =  "Rescheduling Machine Chart"
   ClientHeight    =  5100
   ClientLeft      =  1290
   ClientTop       =  1980
   ClientWidth     =  6825
   BeginProperty Font
      name           =  "MS Sans Serif"
      charset        =  222
      weight         =  700
      size           =  8.25
      underline      =  0   'False
      italic         =  0   'False
      strikethrough  =  0   'False
   EndProperty
   Height          =  5505
   Left            =  1230
   LinkTopic       =  "Form1"
   ScaleHeight     =  5100
   ScaleWidth      =  6825
   Top             =  1635
   Width           =  6945
   Begin VB.PictureBox Number
      AutoRedraw      =  -1  'True
      Height          =  3855
      Left            =  0
      ScaleHeight     =  3795
      ScaleWidth      =  195
      TabIndex        =  7
      Top             =  360
      Width           =  255
   End
   Begin VB.PictureBox Scale_X
      AutoRedraw      =  -1  'True
      Height          =  255
      Left            =  480
      ScaleHeight     =  195
      ScaleWidth      =  5835
      TabIndex        =  6
      Top             =  0
      Width           =  5895
   End
   Begin VB.VScrollBar Scroll_Y
      Height          =  3855
      Left            =  6480
      TabIndex        =  5
      Top             =  360
      Visible         =  0   'False
      Width           =  255
   End
   Begin VB.HScrollBar Scroll_X
      Height          =  255
      Left            =  360
```

```
    TabIndex        =  4
    Top             =  4080
    Visible         =  0   'False
    Width           =  5895
  End
  Begin VB.ComboBox Zoom
    Height          =  315
    ItemData        =  "RChart.frx":0000
    Left            =  720
    List            =  "RChart.frx":0010
    TabIndex        =  3
    Text            =  "Over View"
    Top             =  4680
    Width           =  1455
  End
  Begin VB.CommandButton Obj
    Height          =  375
    Left            =  1680
    TabIndex        =  2
    Top             =  1080
    Visible         =  0   'False
    Width           =  855
  End
  Begin VB.PictureBox Graph
    AutoRedraw      =  -1  'True
    Height          =  3630
    Left            =  360
    ScaleHeight     =  3570
    ScaleWidth      =  5985
    TabIndex        =  1
    Top             =  360
    Width           =  6045
  End
  Begin VB.CommandButton Quit
    Caption         =  "&Close"
    Height          =  375
    Left            =  2880
    TabIndex        =  0
    Top             =  4560
    Width           =  1215
  End
  Begin VB.Label Label1
    AutoSize        =  -1  'True
    Caption         =  "Zoom"
    Height          =  195
    Left            =  120
    TabIndex        =  8
    Top             =  4800
    Width           =  465
  End
End
Attribute VB_Name = "RChart"
Attribute VB_Creatable = False
Attribute VB_Exposed = False
Dim X_size, Y_size As Long
```

```
Dim Begin_X, Begin_Y As Long
Dim Oper_Point, Least As Integer
Dim Old_Y As Long
Dim first_in As Boolean
Sub Out_Box(bx, by, bwidth, bheight As Long, boolor As Long, Dat As String)
   Graph.CurrentX = bx
   Graph.CurrentY = by + 30
   Graph.Line Step(0, 0)-Step(bwidth, bheight - 60), boolor, BF
   Graph.Line Step(0, 0)-Step(-bwidth, 0), QBColor(0), BF
   Graph.Line Step(0, 0)-Step(0, -bheight + 60), QBColor(15), BF
   Graph.Line Step(0, 0)-Step(bwidth, 0), QBColor(15), BF
   Graph.Line Step(0, 0)-Step(0, bheight - 60), QBColor(0), BF
   Graph.CurrentX = bx + Int((bwidth - (Len(Dat) * 100)) / 2)
   Graph.CurrentY = by + Int((bheight - 180) / 2)
   If Graph.CurrentX > bx - 60 Then
      Graph.Print Dat
   End If
End Sub

Sub Out_B_Box(bx, by, bwidth, bheight As Long)
   Graph.CurrentX = bx
   Graph.CurrentY = by + 30
   Graph.Line Step(0, 0)-Step(bwidth, bheight - 60), QBColor(4), BF
   Graph.Line Step(0, 0)-Step(-bwidth, 0), QBColor(0), BF
   Graph.Line Step(0, 0)-Step(0, -bheight + 60), QBColor(15), BF
   Graph.Line Step(0, 0)-Step(bwidth, 0), QBColor(15), BF
   Graph.Line Step(0, 0)-Step(0, bheight - 60), QBColor(0), BF
   Graph.Line Step(0, 0)-Step(-bwidth, -bheight + 60), QBColor(15)
   Graph.Line Step(0, bheight - 60)-Step(bwidth, -bheight + 60), QBColor(15)
End Sub
Sub Output()
   Dim Current, ScaleStep As Integer

   Randomize
   Graph.Cls
   Number.Cls
   scale_x.Cls
   Graph.ForeColor = 0
   i = Begin_X
   ScaleStep = Int(1100 / X_size)
   If ScaleStep = 0 Then ScaleStep = 1
   While ((i - Begin_X) * X_size <= scale_x.Width) And (i <= CInt(RMax_Time))
      scale_x.CurrentX = (i - Begin_X) * X_size
      scale_x.CurrentY = scale_x.Height
      scale_x.Line Step(0, 0)-Step(0, -200), QBColor(0), BF
      temp = Str(i)
      temp = Right(temp, Len(temp) - 1)
      scale_x.CurrentX = scale_x.CurrentX + 20
      scale_x.CurrentY = 0
      scale_x.Print temp
      i = i + ScaleStep
   Wend
   i = Begin_Y
   While (i < Dat.machine.Recordset.RecordCount) And ((i - Begin_Y) * Y_size < Number.Height)
      Dat.machine.Recordset.AbsolutePosition = i
```

```
        Number.CurrentX = 40
        Number.CurrentY = (i - Begin_Y) * Y_size + Int(Y_size / 2) - 120
        Number.Print i + 1
        If Dat.machine.Recordset("b_stop") <> 0 Then
            pX = (Dat.machine.Recordset("b_start") - Begin_X) * X_size
            pY = (i - Begin_Y) * Y_size
            pW = Int((Dat.machine.Recordset("b_stop") - Dat.machine.Recordset("b_start")) * X_size)
            If Y_size > 720 Then
                Out_B_Box pX, pY + Int((Y_size - 720) / 2), pW - 16, 700
            Else
                Out_B_Box pX, pY, pW - 16, Y_size - 10
            End If
        End If
        i = i + 1
    Wend
    Dat.process.Recordset.MoveFirst
    Dat.job.Recordset.MoveFirst
    Current = Dat.process.Recordset("job_number")
    Color = 1
    For i = 0 To Dat.datas.Recordset.RecordCount - 1
        Dat.datas.Recordset.AbsolutePosition = i
        Dat.process.Recordset.AbsolutePosition = i
        If Dat.datas.Recordset("rstart") < Dat.datas.Recordset("rend") Then
            pX = (Dat.datas.Recordset("rstart") - Begin_X) * X_size
            pY = (Dat.datas.Recordset("machine_number") - Begin_Y) * Y_size
            pW = Int((Dat.datas.Recordset("rend") - Dat.datas.Recordset("rstart")) * X_size)
            If Current <> Dat.process.Recordset("job_number") Then
                Current = Dat.process.Recordset("job_number")
                Color = Color + 1
                If Color = 4 Then Color = Color + 1
                Dat.job.Recordset.MoveNext
            End If
            If Y_size > 0 Then
                If Y_size > 720 Then
                    Out_Box pX, pY + Int((Y_size - 720) / 2), pW - 16, 700, QBColor(Color),
Dat.datas.Recordset("process_id")
                Else
                    Out_Box pX, pY, pW - 16, Y_size - 10, QBColor(Color), Dat.datas.Recordset("process_id")
                End If
            End If
        End If
    Next i
    If Dat.Replace.Recordset.RecordCount > 0 Then
        Dat.Replace.Recordset.MoveLast
        For i = 0 To Dat.Replace.Recordset.RecordCount - 1
            Dat.Replace.Recordset.AbsolutePosition = i
            Dat.datas.Recordset.AbsolutePosition = Dat.Replace.Recordset("operation")
            Dat.process.Recordset.AbsolutePosition = Dat.Replace.Recordset("operation")
            pX = (Dat.Replace.Recordset("rstart") - Begin_X) * X_size
            pY = (Dat.Replace.Recordset("machine_num") - Begin_Y) * Y_size
            pW = Int((Dat.Replace.Recordset("rstop") - Dat.Replace.Recordset("rstart")) * X_size)
            tKey = "job_number = " + Str(Dat.process.Recordset("job_number"))
            Dat.job.Recordset.FindFirst tKey
            Color = Dat.job.Recordset.AbsolutePosition + 1
            If Color >= 4 Then
```

```
            Color = Color + 1
          End If
          If Y_size > 720 Then
            Out_Box pX, pY + Int((Y_size - 720) / 2), pW - 16, 700, QBColor(Color),
Dat.datas.Recordset("process_id")
          Else
            Out_Box pX, pY, pW - 16, Y_size - 10, QBColor(Color), Dat.datas.Recordset("process_id")
          End If
        Next i
      End If
End Sub
Sub Arrange_form()
    Scroll_X.Height = 250
    Scroll_Y.Width = 250
    Label1.Left = 100
    Label1.Top = RChart.Height - 700
    Zoom.Left = Label1.Left + Label1.Width + 120
    Zoom.Top = Label1.Top - 100
    scale_x.Height = 250
    scale_x.Top = 100
    Number.Left = 100
    Number.Width = 400
    scale_x.Left = Number.Left + Number.Width + 50
    Number.Top = scale_x.Top + scale_x.Height + 50
    Graph.Left = scale_x.Left
    Graph.Top = Number.Top
    Quit.Left = Int((RChart.Width - Quit.Width) / 2)
    Quit.Top = RChart.Height - 900
    scale_x.Width = RChart.Width - Graph.Left - 200
    Number.Height = Quit.Top - Graph.Top - 200
    X_size = Int((scale_x.Width - 70) / RMax_Time)
    Y_size = Int((Number.Height - 60) / Dat.machine.Recordset.RecordCount)
    Select Case Zoom.ListIndex
    Case 0 'Over View
      Begin_X = 0
      Begin_Y = 0
      Scroll_X.Visible = False
      Scroll_Y.Visible = False
    Case 1 '200%
      If (X_size < 300) Or (Y_size < 1000) Then
        If Y_size < 1000 Then scale_x.Width = scale_x.Width - 350
        If X_size < 300 Then Number.Height = Number.Height - 350
        If Y_size < 1000 Then
          Y_size = Int((Number.Height - 60) / CInt(Dat.machine.Recordset.RecordCount / 2 + 0.005))
          Scroll_Y.Visible = True
          Scroll_Y.Max = Dat.machine.Recordset.RecordCount - CInt(Dat.machine.Recordset.RecordCount / 2)
+ 0.005)
          Scroll_Y.LargeChange = CInt(Scroll_Y.Max * 0.11) + 1
          If Begin_Y > Scroll_Y.Max Then
            Begin_Y = Scroll_Y.Max
          End If
        Else
          Y_size = Int((Number.Height - 60) / Dat.machine.Recordset.RecordCount)
          Begin_Y = 0
          Scroll_Y.Visible = False
```

```
            End If
            If X_size < 300 Then
               X_size = Int(2 * (scale_x.Width - 70) / (RMax_Time))
               Scroll_X.Visible = True
               Scroll_X.Max = RMax_Time - Int(scale_x.Width / X_size)
               Scroll_X.LargeChange = CInt(Scroll_X.Max * 0.11) + 1
            Else
               X_size = Int((scale_x.Width - 70) / (RMax_Time))
               Begin_X = 0
               Scroll_X.Visible = False
            End If
            Scroll_X.Top = Number.Top + Number.Height + 100
            Scroll_Y.Left = scale_x.Left + scale_x.Width + 100
         Else
            Scroll_X.Visible = False
            Scroll_Y.Visible = False
         End If
      Case 2 '400%
         If (X_size < 300) Or (Y_size < 1000) Then
            If Y_size < 1000 Then scale_x.Width = scale_x.Width - 350
            If X_size < 300 Then Number.Height = Number.Height - 350
            If Y_size < 1000 Then
               Y_size = Int((Number.Height - 60) / CInt(Dat.machine.Recordset.RecordCount / 4 + 0.5))
               Scroll_Y.Visible = True
               Scroll_Y.Max = Dat.machine.Recordset.RecordCount - CInt(Dat.machine.Recordset.RecordCount / 4
+ 0.5)
               Scroll_Y.LargeChange = CInt(Scroll_Y.Max * 0.11) + 1
               If Begin_Y > Scroll_Y.Max Then
                  Begin_Y = Scroll_Y.Max
               End If
            Else
               Y_size = Int((Number.Height - 60) / Dat.machine.Recordset.RecordCount)
               Begin_Y = 0
               Scroll_Y.Visible = False
            End If
            If X_size < 300 Then
               X_size = Int(4 * (scale_x.Width - 70) / (RMax_Time))
               Scroll_X.Visible = True
               Scroll_X.Max = RMax_Time - Int(scale_x.Width / X_size)
               Scroll_X.LargeChange = CInt(Scroll_X.Max * 0.11) + 1
            Else
               X_size = Int((scale_x.Width - 70) / (RMax_Time))
               Begin_X = 0
               Scroll_X.Visible = False
            End If
            Scroll_X.Top = Number.Top + Number.Height + 100
            Scroll_Y.Left = scale_x.Left + scale_x.Width + 100
         Else
            Scroll_X.Visible = False
            Scroll_Y.Visible = False
         End If
      Case 3 'Detail View
         If (X_size < 300) Or (Y_size < 1000) Then
            If Y_size < 1000 Then scale_x.Width = scale_x.Width - 350
            If X_size < 300 Then Number.Height = Number.Height - 350
```

```
            If Y_size < 1000 Then
               temp = Int((Number.Height - 60) / 1000)
               Y_size = Int((Number.Height - 60) / temp)
               Scroll_Y.Visible = True
               Scroll_Y.Max = Dat.machine.Recordset.RecordCount - temp
               Scroll_Y.LargeChange = CInt(Scroll_Y.Max * 0.11) + 1
               If Begin_Y > Scroll_Y.Max Then
                  Begin_Y = Scroll_Y.Max
               End If
            Else
               Y_size = Int((Number.Height - 60) / Dat.machine.Recordset.RecordCount)
               Begin_Y = 0
               Scroll_Y.Visible = False
            End If
            If X_size < 300 Then
               X_size = 300
               Scroll_X.Visible = True
               Scroll_X.Max = RMax_Time - Int(scale_x.Width / X_size)
               Scroll_X.LargeChange = CInt(Scroll_X.Max * 0.11) + 1
            Else
               X_size = Int((scale_x.Width - 70) / (RMax_Time))
               Begin_X = 0
               Scroll_X.Visible = False
            End If
            Scroll_X.Top = Number.Top + Number.Height + 100
            Scroll_Y.Left = scale_x.Left + scale_x.Width + 100
         Else
            Scroll_X.Visible = False
            Scroll_Y.Visible = False
         End If
      End Select
      Graph.Width = scale_x.Width
      Graph.Height = Number.Height
      Scroll_X.Left = Graph.Left
      Scroll_X.Width = Graph.Width
      Scroll_Y.Top = Graph.Top
      Scroll_Y.Height = Graph.Height
      Output
   End Sub


   Private Sub Form_Activate()
      Randomize
      If (RMax_Time > 0) Then
         Arrange_form
         If first_in Then
            first_in = False
            Zoom.ListIndex = 0
         End If
      Else
         temp = MsgBox("Error! Data not ready", vbOKOnly, "Error")
         RChart.Enabled = False
         RChart.Visible = False
         Unload RChart
         Main.Enabled = True
```

```
        Main.Visible = True
    End If
End Sub

Private Sub Form_Load()
    first_in = True
End Sub


Private Sub Form_Resize()
    If Not (first_in) Then
        If WindowState <> 1 Then
            If RChart.Height < (2500 + Dat.machine.Recordset.RecordCount * 300) Then
                RChart.Height = (2500 + Dat.machine.Recordset.RecordCount * 300)
            End If
            If RChart.Width < 6500 Then
                RChart.Width = 6500
            End If
            Arrange_form
        End If
    End If
End Sub


Private Sub Form_Unload(Cancel As Integer)
    RChart.Enabled = False
    RChart.Visible = False
    Unload RChart
    Main.Enabled = True
    Main.Visible = True
End Sub

Private Sub Graph_MouseDown(Button As Integer, Shift As Integer, X As Single, Y As Single)
    Dim tY, tX As Double
    Dim aY As Integer
    Dim aX As Single
    Dim temp, temp1 As Long
    Dim found As Boolean
    Dim Message As String

    Graph.CurrentX = X
    Graph.CurrentY = Y
    If Button > 1 Then
        aY = Int(Graph.CurrentY / Y_size)
        If Y_size > 720 Then
            temp = aY * Y_size + Int((Y_size - 720) / 2)
            temp1 = (aY + 1) * Y_size - Int((Y_size - 720) / 2)
        Else
            temp = aY * Y_size
            temp1 = temp + Y_size
        End If
        If (Graph.CurrentY > temp) And (Graph.CurrentY < temp1) Then
            aY = aY + Begin_Y
            Dat.machine.Recordset.AbsolutePosition = aY
            aX = Graph.CurrentX / X_size + Begin_X
```

```
        Dat.datas.Recordset.MoveFirst
        If (aX >= Dat.machine.Recordset("b_start")) And (aX <= Dat.machine.Recordset("b_stop")) Then
           m1 = "Machine                    " & Dat.machine.Recordset("machine_name") & Chr(10) & Chr(13)
           m2 = "Start                      " & Format(Dat.machine.Recordset("b_start"), "#,##0.00") &
Chr(10) & Chr(13)
           m3 = "End                        " & Format(Dat.machine.Recordset("b_stop"), "#,##0.00") &
Chr(10) & Chr(13)
           Message = m1 & m2 & m3
           temp = MsgBox(Message, vbOKOnly, "Machine Break Down Data")
        Else
           found = False
           Do
              If (Dat.datas.Recordset("rstart") < aX) And (aX < Dat.datas.Recordset("rend")) And
(Dat.datas.Recordset("machine_number") = aY) Then
                 found = True
                 Exit Do
              ElseIf (Dat.datas.Recordset.AbsolutePosition >= Dat.datas.Recordset.RecordCount - 1) Then
                 Exit Do
              End If
              Dat.datas.Recordset.MoveNext
           Loop Until (found)
           If Not (found) Then
              Dat.Replace.Recordset.MoveFirst
              Do
                 If (Dat.Replace.Recordset("rstart") < aX) And (aX < Dat.Replace.Recordset("rstop")) And
(Dat.Replace.Recordset("machine_num") = aY) Then
                    found = True
                    Exit Do
                 ElseIf (Dat.Replace.Recordset.AbsolutePosition >= Dat.Replace.Recordset.RecordCount - 1)
Then
                    Exit Do
                 End If
                 Dat.Replace.Recordset.MoveNext
              Loop Until (found)
              If found Then
                 Dat.process.Recordset.AbsolutePosition = Dat.Replace.Recordset("operation")
                 temp2 = "Job_number = " + Str(Dat.process.Recordset("Job_number"))
                 Dat.job.Recordset.FindFirst temp2
                 m1 = "Job                    " & Dat.job.Recordset("job_name") & Chr(10) & Chr(13)
                 m2 = "Opertion               " & Dat.process.Recordset("process_name") & Chr(10) &
Chr(13)
                 m3 = "Machine                " & Dat.machine.Recordset("machine_name") & Chr(10) &
Chr(13)
                 m4 = "Start                  " & Format(Dat.Replace.Recordset("rstart"), "#,##0.00") &
Chr(10) & Chr(13)
                 m5 = "End                    " & Format(Dat.Replace.Recordset("rstop"), "#,##0.00") &
Chr(10) & Chr(13)
                 m6 = "Processing Time        " & Format(Dat.Replace.Recordset("rstop") -
Dat.Replace.Recordset("rstart"), "#,##0.00") & Chr(10) & Chr(13)
                 Message = m1 & m2 & m3 & m4 & m5 & m6
                 temp = MsgBox(Message, vbOKOnly, "Data")
              End If
              found = False
           End If
           If found Then
```

```
                Dat.process.Recordset.AbsolutePosition = Dat.datas.Recordset.AbsolutePosition
                temp2 = "Job_number = " + Str(Dat.process.Recordset("Job_number"))
                Dat.job.Recordset.FindFirst temp2
                m1 = "Job                    " & Dat.job.Recordset("job_name") & Chr(10) & Chr(13)
                m2 = "Opertion               " & Dat.process.Recordset("process_name") & Chr(10) & Chr(13)
                m3 = "Machine                " & Dat.machine.Recordset("machine_name") & Chr(10) &
Chr(13)
                m4 = "Start                  " & Format(Dat.datas.Recordset("rstart"), "#,##0.00") & Chr(10)
& Chr(13)
                m5 = "End                    " & Format(Dat.datas.Recordset("rend"), "#,##0.00") & Chr(10)
& Chr(13)
                m6 = "Processing Time        " & Format(Dat.datas.Recordset("rend") -
Dat.datas.Recordset("rstart"), "#,##0.00") & Chr(10) & Chr(13)
                Message = m1 & m2 & m3 & m4 & m5 & m6
                temp = MsgBox(Message, vbOKOnly, "Data")
            End If
        End If
    End If
  Else
    tY = Int(Graph.CurrentY / Y_size)
    If Y_size > 720 Then
      temp = tY * Y_size + Int((Y_size - 720) / 2)
      temp1 = (tY + 1) * Y_size - Int((Y_size - 720) / 2)
    Else
      temp = tY * Y_size
      temp1 = temp + Y_size
    End If
    If (Graph.CurrentY > temp) And (Graph.CurrentY < temp + 500) Then
      tY = tY + Begin_Y
      Dat.machine.Recordset.AbsolutePosition = tY
      tX = Graph.CurrentX / X_size + Begin_X
      Dat.datas.Recordset.MoveFirst
      found = False
      Do
        If (Dat.datas.Recordset("rstart") < tX) And (tX < Dat.datas.Recordset("rend")) And
(Dat.datas.Recordset("machine_number") = tY) Then
          found = True
          Dat.process.Recordset.AbsolutePosition = Dat.datas.Recordset.AbsolutePosition
          temp = Dat.process.Recordset("job_number")
          If Dat.process.Recordset.AbsolutePosition > 0 Then
            Dat.process.Recordset.MovePrevious
            If Dat.process.Recordset("job_number") = temp Then
              Dat.datas.Recordset.MovePrevious
              Least = Dat.datas.Recordset("rend")
              Dat.datas.Recordset.MoveNext
            Else
              Least = 0
            End If
            Dat.process.Recordset.MoveNext
          Else
            Least = 0
          End If
          Graph.MousePointer = 2
          Oper_Point = Dat.datas.Recordset.AbsolutePosition
          pX = Dat.datas.Recordset("rstart") * X_size
```

```
                pY = Dat.datas.Recordset("machine_number") * Y_size
                pW = Dat.process.Recordset("processing_time") * X_size
                Obj.Left = Graph.Left + pX + 30
                Old_Y = Obj.Top
                Obj.Top = Graph.Top + pY + Int((Y_size - 720) / 2) + 25
                Obj.Width = pW - 16
                Obj.Height = 720
                Obj.Caption = Dat.datas.Recordset("process_id")
                Obj.Visible = True
                Exit Do
            Else
                If (Dat.datas.Recordset.AbsolutePosition >= Dat.datas.Recordset.RecordCount - 1) Then
                    Exit Do
                End If
            End If
            Dat.datas.Recordset.MoveNext
        Loop Until (found)
    End If
  End If
End Sub

Private Sub Graph_MouseMove(Button As Integer, Shift As Integer, X As Single, Y As Single)
  If Obj.Visible Then
    temp = Int(X / X_size) + Begin_X
    If temp < Least Then
        temp = Least
    ElseIf temp < Begin_X Then
        Scroll_X.Value = Scroll_X.Value - Int(Begin_X - temp)
    End If
    If temp > RMax_Time Then
        temp = RMax_Time
    ElseIf temp - Begin_X >= Int((Graph.Width - 70) / X_size) Then
        If Scroll_X.Value < Scroll_X.Max Then
            Scroll_X.Value = Scroll_X.Value + temp - Begin_X - Int((Graph.Width - 70) / X_size)
        End If
    End If
    Obj.Left = Graph.Left + 30 + (temp - Begin_X) * X_size
  End If
End Sub

Private Sub Graph_MouseUp(Button As Integer, Shift As Integer, X As Single, Y As Single)
  Dim pX As Double
  Dim tX As Integer

  Dat.datas.Recordset.AbsolutePosition = Oper_Point
  tX = Int((Obj.Left - Graph.Left) / X_size)
  If Dat.datas.Recordset("rstart") <> tX Then
    Beep
    RChange_Prepare Oper_Point, tX
    RReArrange
    Gen_RPerformance
    RescheduleTable.Fill_Table
    RTable.Fill_Table
    RMcTable.Fill_Table
  End If
```

```
    Graph.MousePointer = 1
    Obj.Visible = False
    Output
End Sub

Private Sub Quit_Click()
    RChart.Enabled = False
    RChart.Visible = False
    Unload RChart
    Main.Enabled = True
    Main.Visible = True
End Sub

Private Sub Scroll_X_Change()
    Begin_X = Scroll_X.Value
    Output
End Sub

Private Sub Scroll_Y_Change()
    Begin_Y = Scroll_Y.Value
    Output
End Sub
Private Sub Zoom_Click()
    Arrange_form
End Sub
```

```
VERSION 4.00
Begin VB.Form ReJobTable
   Caption         =   "Rescheduling Machine Table"
   ClientHeight    =   5340
   ClientLeft      =   990
   ClientTop       =   2055
   ClientWidth     =   7725
   Height          =   5745
   Left            =   930
   LinkTopic       =   "Form1"
   ScaleHeight     =   5340
   ScaleWidth      =   7725
   Top             =   1710
   Width           =   7845
   Begin VB.CommandButton Quit
      Caption         =   "&Close"
      BeginProperty Font
         name            =   "MS Sans Serif"
         charset         =   222
         weight          =   700
         size            =   8.25
         underline       =   0   'False
         italic          =   0   'False
         strikethrough   =   0   'False
      EndProperty
      Height          =   375
      Left            =   2640
      TabIndex        =   0
      Top             =   3960
      Width           =   1215
   End
   Begin VB.Label Border
      BorderStyle     =   1  'Fixed Single
      BeginProperty Font
         name            =   "MS Sans Serif"
         charset         =   222
         weight          =   700
         size            =   8.25
         underline       =   0   'False
         italic          =   0   'False
         strikethrough   =   0   'False
      EndProperty
      Height          =   2655
      Left            =   0
      TabIndex        =   9
      Top             =   360
      Width           =   6135
   End
   Begin VB.Label Label7
      Alignment       =   2  'Center
      BackColor       =   &H00808080&
      BorderStyle     =   1  'Fixed Single
      Caption         =   "ProcessingTime"
      BeginProperty Font
         name            =   "MS Sans Serif"
```

```
    charset        =  222
    weight         =  700
    size           =  8.25
    underline      =  0   'False
    italic         =  0   'False
    strikethrough  =  0   'False
  EndProperty
  Height         =  255
  Left           =  6600
  TabIndex       =  8
  Top            =  0
  Width          =  975
End
Begin MSGrid.Grid Table
  Height         =  1335
  Left           =  120
  TabIndex       =  7
  Top            =  480
  Width          =  4815
  _Version       =  65536
  _ExtentX       =  8493
  _ExtentY       =  2355
  _StockProps    =  77
  BackColor      =  16777215
  BeginProperty Font {0BE35203-8F91-11CE-9DE3-00AA004BB851}
    name           =  "MS Sans Serif"
    charset        =  222
    weight         =  700
    size           =  8.25
    underline      =  0   'False
    italic         =  0   'False
    strikethrough  =  0   'False
  EndProperty
  BorderStyle    =  0
  Rows           =  1
  Cols           =  7
  FixedRows      =  0
  FixedCols      =  0
  ScrollBars     =  2
End
Begin VB.Label Label4
  Alignment      =  2  'Center
  BackColor      =  &H00808080&
  BorderStyle    =  1  'Fixed Single
  Caption        =  "Starting Time"
  BeginProperty Font
    name           =  "MS Sans Serif"
    charset        =  222
    weight         =  700
    size           =  8.25
    underline      =  0   'False
    italic         =  0   'False
    strikethrough  =  0   'False
  EndProperty
  Height         =  255
```

```
  Left            =  4080
  TabIndex        =  6
  Top             =  0
  Width           =  1470
End
Begin VB.Label Label5
  Alignment       =  2  'Center
  BackColor       =  &H00808080&
  BorderStyle     =  1  'Fixed Single
  Caption         =  "Ending time"
  BeginProperty Font
    name          =  "MS Sans Serif"
    charset       =  222
    weight        =  700
    size          =  8.25
    underline     =  0   'False
    italic        =  0   'False
    strikethrough =  0   'False
  EndProperty
  Height          =  255
  Left            =  5520
  TabIndex        =  5
  Top             =  0
  Width           =  1095
End
Begin VB.Label Label1
  Alignment       =  2  'Center
  BackColor       =  &H00808080&
  BorderStyle     =  1  'Fixed Single
  Caption         =  "Machine Name"
  BeginProperty Font
    name          =  "MS Sans Serif"
    charset       =  222
    weight        =  700
    size          =  8.25
    underline     =  0   'False
    italic        =  0   'False
    strikethrough =  0   'False
  EndProperty
  Height          =  255
  Left            =  360
  TabIndex        =  4
  Top             =  0
  Width           =  975
End
Begin VB.Label Label3
  Alignment       =  2  'Center
  BackColor       =  &H00808080&
  BorderStyle     =  1  'Fixed Single
  Caption         =  "Operation Name"
  BeginProperty Font
    name          =  "MS Sans Serif"
    charset       =  222
    weight        =  700
    size          =  8.25
```

```
      underline      =  0   'False
      italic         =  0   'False
      strikethrough  =  0   'False
    EndProperty
    Height         =  255
    Left           =  2760
    TabIndex       =  3
    Top            =  0
    Width          =  1335
  End
  Begin VB.Label Label2
    Alignment      =  2  'Center
    BackColor      =  &H00808080&
    BorderStyle    =  1  'Fixed Single
    Caption        =  "Job Name"
    BeginProperty Font
      name           =  "MS Sans Serif"
      charset        =  222
      weight         =  700
      size           =  8.25
      underline      =  0   'False
      italic         =  0   'False
      strikethrough  =  0   'False
    EndProperty
    Height         =  255
    Left           =  1320
    TabIndex       =  2
    Top            =  0
    Width          =  1455
  End
  Begin VB.Label Label6
    AutoSize       =  -1  'True
    BackColor      =  &H00808080&
    BorderStyle    =  1  'Fixed Single
    Caption        =  "No."
    BeginProperty Font
      name           =  "MS Sans Serif"
      charset        =  222
      weight         =  700
      size           =  8.25
      underline      =  0   'False
      italic         =  0   'False
      strikethrough  =  0   'False
    EndProperty
    Height         =  255
    Left           =  0
    TabIndex       =  1
    Top            =  0
    Width          =  360
  End
End
Attribute VB_Name = "ReJobTable"
Attribute VB_Creatable = False
Attribute VB_Exposed = False
Sub Fill_Table()
```

```
Dim First, cur As Integer
Dim Quit1, Quit2, Have_First As Boolean
Dim tKey, tKey2 As String

Table.ColAlignment(0) = 1
Table.ColAlignment(1) = 0
Table.ColAlignment(2) = 0
Table.ColAlignment(3) = 0
Table.ColAlignment(4) = 1
Table.ColAlignment(5) = 1
Table.ColAlignment(6) = 1
Dat.job.Recordset.MoveLast
Dat.process.Recordset.MoveLast
Dat.datas.Recordset.MoveLast
Table.Rows = 1
First = 0
For i = 0 To Dat.machine.Recordset.RecordCount - 1
   If i <> 0 Then
      Table.AddItem "", Table.Rows
      First = Table.Rows - 1
   End If
   Dat.machine.Recordset.AbsolutePosition = i
   tKey = "machine_number = " & Str(i)
   Dat.datas.Recordset.FindFirst tKey
   If Dat.datas.Recordset("rstart") < Dat.datas.Recordset("rend") Then
      Dat.process.Recordset.AbsolutePosition = Dat.datas.Recordset.AbsolutePosition
      tKey2 = "job_number = " & Str(Dat.process.Recordset("job_number"))
      Dat.job.Recordset.FindFirst tKey2
      Table.Row = First
      Table.Col = 0
      Table.Text = ""
      Table.Col = 1
      Table.Text = ""
      Table.Col = 2
      Table.Text = Dat.job.Recordset("job_name")
      Table.Col = 3
      Table.Text = Dat.process.Recordset("process_name")
      Table.Col = 4
      Table.Text = Format(Dat.datas.Recordset("rstart"), "#,##0.00")
      Table.Col = 5
      Table.Text = Format(Dat.datas.Recordset("rend"), "#,##0.00")
      Table.Col = 6
      Table.Text = Format(Dat.datas.Recordset("rend") - Dat.datas.Recordset("rstart"), "#,##0.00")
      Have_First = True
   Else
      Have_First = False
   End If
   Quit1 = False
   Do
      Dat.datas.Recordset.FindNext tKey
      If Not (Dat.datas.Recordset.NoMatch) Then
         Quit2 = False
         cur = First
         If Have_First Then
            Do
```

```
                Table.Row = cur
                Table.Col = 4
                If Dat.datas.Recordset("rstart") < CDbl(Table.Text) Then
                   Quit2 = True
                Else
                   cur = cur + 1
                   If cur = Table.Rows Then Quit2 = True
                End If
             Loop Until Quit2
          End If
          If Dat.datas.Recordset("rstart") < Dat.datas.Recordset("rend") Then
             If Have_First Then Table.AddItem "", cur
             Table.Row = cur
             Dat.process.Recordset.AbsolutePosition = Dat.datas.Recordset.AbsolutePosition
             tKey2 = "job_number = " & Str(Dat.process.Recordset("job_number"))
             Dat.job.Recordset.FindFirst tKey2
             Table.Col = 0
             Table.Text = ""
             Table.Col = 1
             Table.Text = ""
             Table.Col = 2
             Table.Text = Dat.job.Recordset("job_name")
             Table.Col = 3
             Table.Text = Dat.process.Recordset("process_name")
             Table.Col = 4
             Table.Text = Format(Dat.datas.Recordset("rstart"), "#,##0.00")
             Table.Col = 5
             Table.Text = Format(Dat.datas.Recordset("rend"), "#,##0.00")
             Table.Col = 6
             Table.Text = Format(Dat.datas.Recordset("rend") - Dat.datas.Recordset("rstart"), "#,##0.00")
             Have_First = True
          End If
       Else
          Quit1 = True
       End If
    Loop Until Quit1
    tKey = "machine_num = " & Str(i)
    Dat.Replace.Recordset.FindFirst tKey
    If Not (Dat.Replace.Recordset.NoMatch) Then
       Quit2 = False
       cur = First
       If Have_First Then
          Do
             Table.Row = cur
             Table.Col = 4
             If Dat.Replace.Recordset("rstart") < CDbl(Table.Text) Then
                Quit2 = True
             Else
                cur = cur + 1
                If cur = Table.Rows Then Quit2 = True
             End If
          Loop Until Quit2
          Table.AddItem "", cur
       End If
       Table.Row = cur
```

```
Dat.datas.Recordset.AbsolutePosition = Dat.Replace.Recordset("operation")
Dat.process.Recordset.AbsolutePosition = Dat.Replace.Recordset("operation")
tKey2 = "job_number = " & Str(Dat.process.Recordset("job_number"))
Dat.job.Recordset.FindFirst tKey2
Table.Col = 0
Table.Text = ""
Table.Col = 1
Table.Text = ""
Table.Col = 2
Table.Text = Dat.job.Recordset("job_name")
Table.Col = 3
Table.Text = Dat.process.Recordset("process_name")
Table.Col = 4
Table.Text = Format(Dat.Replace.Recordset("rstart"), "#,##0.00")
Table.Col = 5
Table.Text = Format(Dat.Replace.Recordset("rstop"), "#,##0.00")
Table.Col = 6
Table.Text = Format(Dat.Replace.Recordset("rstop") - Dat.Replace.Recordset("rstart"), "#,##0.00")
Quit1 = False
Do
   Dat.Replace.Recordset.FindNext tKey
   If Not (Dat.Replace.Recordset.NoMatch) Then
      Quit2 = False
      cur = First
      Do
         Table.Row = cur
         Table.Col = 4
         If Dat.Replace.Recordset("rstart") < CDbl(Table.Text) Then
            Quit2 = True
         Else
            cur = cur + 1
            If cur = Table.Rows Then Quit2 = True
         End If
      Loop Until Quit2
      Table.AddItem "", cur
      Table.Row = cur
      Dat.datas.Recordset.AbsolutePosition = Dat.Replace.Recordset("operation")
      Dat.process.Recordset.AbsolutePosition = Dat.Replace.Recordset("operation")
      tKey2 = "job_number = " & Str(Dat.process.Recordset("job_number"))
      Dat.job.Recordset.FindFirst tKey2
      Table.Col = 0
      Table.Text = ""
      Table.Col = 1
      Table.Text = ""
      Table.Col = 2
      Table.Text = Dat.job.Recordset("job_name")
      Table.Col = 3
      Table.Text = Dat.process.Recordset("process_name")
      Table.Col = 4
      Table.Text = Format(Dat.Replace.Recordset("rstart"), "#,##0.00")
      Table.Col = 5
      Table.Text = Format(Dat.Replace.Recordset("rstop"), "#,##0.00")
      Table.Col = 6
      Table.Text = Format(Dat.Replace.Recordset("rstop") - Dat.Replace.Recordset("rstart"), "#,##0.00")
   Else
```

```
                Quit1 = True
            End If
        Loop Until Quit1
    End If
    Table.Row = First
    Table.Col = 0
    Table.Text = Str(i + 1)
    Table.Col = 1
    Table.Text = Dat.machine.Recordset("machine_name")
  Next i
End Sub
Sub Arrange_form()
  Border.Left = 90
  Border.Top = 300
  Border.Width = ReJobTable.Width - 320
  Border.Height = ReJobTable.Height - 1200
  Table.Left = Border.Left + 40
  Table.Top = Border.Top + 40
  Table.Width = Border.Width - 80
  Table.Height = Border.Height - 80
  Quit.Left = Int((ReJobTable.Width - Quit.Width) / 2)
  Quit.Top = ReJobTable.Height - 820
  If Table.Height > (Table.RowHeight(0) + 15) * Table.Rows Then
    Label6.Top = 10
    Label6.Width = 500
    Label6.Left = 100
    Label7.Top = Label6.Top
    Label7.Width = 1400
    Label7.Left = ReJobTable.Width - Label7.Width - 220
    Label5.Top = Label6.Top
    Label5.Width = 1400
    Label5.Left = Label7.Left - Label5.Width - 20
    Label4.Top = Label6.Top
    Label4.Width = 1400
    Label4.Left = Label5.Left - Label4.Width - 20
    temp = Int((Label4.Left - 1000) / 3)
    Label3.Top = Label6.Top
    Label3.Width = temp
    Label3.Left = Label4.Left - temp - 20
    temp = Int((Label3.Left - 1000) / 2)
    Label2.Top = Label6.Top
    Label2.Width = temp
    Label2.Left = Label3.Left - temp - 20
    Label1.Top = Label6.Top
    Label1.Width = Label2.Left - 630
    Label1.Left = 610
    Table.ColWidth(0) = Label6.Width - 30
    Table.ColWidth(1) = Label1.Width
    Table.ColWidth(2) = Label2.Width
    Table.ColWidth(3) = Label3.Width
    Table.ColWidth(4) = Label4.Width
    Table.ColWidth(5) = Label5.Width
    Table.ColWidth(6) = Label7.Width - 30
  Else
    Label6.Top = 10
```

```
        Label6.Width = 500
        Label6.Left = 100
        Label7.Top = Label6.Top
        Label7.Width = 1400
        Label7.Left = ReJobTable.Width - Label7.Width - 480
        Label5.Top = Label6.Top
        Label5.Width = 1400
        Label5.Left = Label7.Left - Label5.Width - 20
        Label4.Top = Label6.Top
        Label4.Width = 1400
        Label4.Left = Label5.Left - Label4.Width - 20
        temp = Int((Label4.Left - 1000) / 3)
        Label3.Top = Label6.Top
        Label3.Width = temp
        Label3.Left = Label4.Left - temp - 20
        temp = Int((Label3.Left - 1000) / 2)
        Label2.Top = Label6.Top
        Label2.Width = temp
        Label2.Left = Label3.Left - temp - 20
        Label1.Top = Label6.Top
        Label1.Width = Label2.Left - 630
        Label1.Left = 610
        Table.ColWidth(0) = Label6.Width - 30
        Table.ColWidth(1) = Label1.Width
        Table.ColWidth(2) = Label2.Width
        Table.ColWidth(3) = Label3.Width
        Table.ColWidth(4) = Label4.Width
        Table.ColWidth(5) = Label5.Width
        Table.ColWidth(6) = Label7.Width - 25
    End If
End Sub
Private Sub Form_Activate()
    Arrange_form
End Sub
Private Sub Form_Resize()
    If ReJobTable.WindowState <> 1 Then
        If ReJobTable.Width < 9000 Then ReJobTable.Width = 9000
        If ReJobTable.Height < 3000 Then ReJobTable.Height = 3000
        Arrange_form
    End If
End Sub
Private Sub Form_Unload(Cancel As Integer)
    ReJobTable.Enabled = False
    ReJobTable.Visible = False
    Unload ReJobTable
    Main.Enabled = True
    Main.Visible = True
End Sub
Private Sub Quit_Click()
    ReJobTable.Enabled = False
    ReJobTable.Visible = False
    Unload ReJobTable
    Main.Enabled = True
    Main.Visible = True
End Sub
```

```
VERSION 4.00
Begin VB.Form ReplaceOp
   Caption        =  "Rescheduling Alternative Machine Option"
   ClientHeight   =  3120
   ClientLeft     =  2475
   ClientTop      =  2775
   ClientWidth    =  4920
   Height         =  3525
   Left           =  2415
   LinkTopic      =  "Form1"
   ScaleHeight    =  3120
   ScaleWidth     =  4920
   Top            =  2430
   Visible        =  0  'False
   Width          =  5040
   Begin VB.Frame Frame1
      Caption        =  "Options"
      BeginProperty Font
         name           =  "MS Sans Serif"
         charset        =  222
         weight         =  700
         size           =  8.25
         underline      =  0  'False
         italic         =  0  'False
         strikethrough  =  0  'False
      EndProperty
      Height         =  2055
      Left           =  720
      TabIndex       =  2
      Top            =  240
      Width          =  3495
      Begin VB.OptionButton DoReplace
         Caption        =  "Alternative"
         BeginProperty Font
            name           =  "MS Sans Serif"
            charset        =  222
            weight         =  700
            size           =  8.25
            underline      =  0  'False
            italic         =  0  'False
            strikethrough  =  0  'False
         EndProperty
         Height         =  375
         HelpContextID  =  3
         Left           =  1080
         TabIndex       =  4
         Top            =  480
         Value          =  -1  'True
         Width          =  1335
      End
      Begin VB.OptionButton NoReplace
         Caption        =  "Non Alternative"
         BeginProperty Font
            name           =  "MS Sans Serif"
            charset        =  222
```

```
        weight          =  700
        size            =  8.25
        underline       =  0   'False
        italic          =  0   'False
        strikethrough   =  0   'False
      EndProperty
      Height          =  375
      Left            =  1080
      TabIndex        =  3
      Top             =  1320
      Width           =  1815
    End
  End
  Begin VB.CommandButton Ok
    Caption         =  "&Ok"
    BeginProperty Font
      name            =  "MS Sans Serif"
      charset         =  222
      weight          =  700
      size            =  8.25
      underline       =  0   'False
      italic          =  0   'False
      strikethrough   =  0   'False
    EndProperty
    Height          =  375
    Left            =  720
    TabIndex        =  1
    Top             =  2640
    Width           =  1455
  End
  Begin VB.CommandButton Cancel
    Caption         =  "&Cancel"
    BeginProperty Font
      name            =  "MS Sans Serif"
      charset         =  222
      weight          =  700
      size            =  8.25
      underline       =  0   'False
      italic          =  0   'False
      strikethrough   =  0   'False
    EndProperty
    Height          =  375
    Left            =  2760
    TabIndex        =  0
    Top             =  2640
    Width           =  1455
  End
End
Attribute VB_Name = "ReplaceOp"
Attribute VB_Creatable = False
Attribute VB_Exposed = False
Private Sub Cancel_Click()
  ReplaceOp.Enabled = False
  ReplaceOp.Visible = False
  Unload ReplaceOp
```

```
    Main.SetFocus
End Sub

Private Sub Form_Load()
    If Replace Then
        DoReplace.Value = True
        NoReplace.Value = False
    Else
        DoReplace.Value = False
        NoReplace.Value = True
    End If
End Sub


Private Sub Ok_Click()
    Randomize
    If DoReplace.Value Then
        Replace = True
    Else
        Replace = False
    End If
    ReplaceOp.Enabled = False
    ReplaceOp.Visible = False
    Unload C_Option
    Main.SetFocus
End Sub
```

```
VERSION 4.00
Begin VB.Form RescheduleTable
   Caption        =  "Rescheduling Job Table"
   ClientHeight   =  4785
   ClientLeft     =  690
   ClientTop      =  2070
   ClientWidth    =  8310
   Height         =  5190
   Left           =  630
   LinkTopic      =  "Form1"
   ScaleHeight    =  4785
   ScaleWidth     =  8310
   Top            =  1725
   Width          =  8430
   Begin VB.CommandButton Quit
      Caption        =  "&Close"
      BeginProperty Font
         name           =  "MS Sans Serif"
         charset        =  222
         weight         =  700
         size           =  8.25
         underline      =  0   'False
         italic         =  0   'False
         strikethrough  =  0   'False
      EndProperty
      Height         =  375
      Left           =  2840
      TabIndex       =  0
      Top            =  3960
      Width          =  1215
   End
   Begin VB.Label Label7
      Alignment      =  2  'Center
      BackColor      =  &H00808080&
      BorderStyle    =  1  'Fixed Single
      Caption        =  "ProcessingTime"
      BeginProperty Font
         name           =  "MS Sans Serif"
         charset        =  222
         weight         =  700
         size           =  8.25
         underline      =  0   'False
         italic         =  0   'False
         strikethrough  =  0   'False
      EndProperty
      Height         =  255
      Left           =  6600
      TabIndex       =  9
      Top            =  0
      Width          =  975
   End
   Begin VB.Label Label6
      AutoSize       =  -1  'True
      BackColor      =  &H00808080&
      BorderStyle    =  1  'Fixed Single
```

```
    Caption         =  "No."
    BeginProperty Font
      name          =  "MS Sans Serif"
      charset       =  222
      weight        =  700
      size          =  8.25
      underline     =  0   'False
      italic        =  0   'False
      strikethrough =  0   'False
    EndProperty
    Height          =  255
    Left            =  0
    TabIndex        =  8
    Top             =  0
    Width           =  360
  End
  Begin VB.Label Label2
    Alignment       =  2  'Center
    BackColor       =  &H00808080&
    BorderStyle     =  1  'Fixed Single
    Caption         =  "Operation Name"
    BeginProperty Font
      name          =  "MS Sans Serif"
      charset       =  222
      weight        =  700
      size          =  8.25
      underline     =  0   'False
      italic        =  0   'False
      strikethrough =  0   'False
    EndProperty
    Height          =  255
    Left            =  1320
    TabIndex        =  7
    Top             =  0
    Width           =  1455
  End
  Begin VB.Label Label3
    Alignment       =  2  'Center
    BackColor       =  &H00808080&
    BorderStyle     =  1  'Fixed Single
    Caption         =  "Machine Name"
    BeginProperty Font
      name          =  "MS Sans Serif"
      charset       =  222
      weight        =  700
      size          =  8.25
      underline     =  0   'False
      italic        =  0   'False
      strikethrough =  0   'False
    EndProperty
    Height          =  255
    Left            =  2760
    TabIndex        =  6
    Top             =  0
    Width           =  1335
```

```
End
Begin VB.Label Label1
   Alignment      =  2  'Center
   BackColor      =  &H00808080&
   BorderStyle    =  1  'Fixed Single
   Caption        =  "Job Name"
   BeginProperty Font
      name           =  "MS Sans Serif"
      charset        =  222
      weight         =  700
      size           =  8.25
      underline      =  0   'False
      italic         =  0   'False
      strikethrough  =  0   'False
   EndProperty
   Height         =  255
   Left           =  360
   TabIndex       =  5
   Top            =  0
   Width          =  975
End
Begin VB.Label Label5
   Alignment      =  2  'Center
   BackColor      =  &H00808080&
   BorderStyle    =  1  'Fixed Single
   Caption        =  "Ending time"
   BeginProperty Font
      name           =  "MS Sans Serif"
      charset        =  222
      weight         =  700
      size           =  8.25
      underline      =  0   'False
      italic         =  0   'False
      strikethrough  =  0   'False
   EndProperty
   Height         =  255
   Left           =  5520
   TabIndex       =  4
   Top            =  0
   Width          =  1095
End
Begin VB.Label Label4
   Alignment      =  2  'Center
   BackColor      =  &H00808080&
   BorderStyle    =  1  'Fixed Single
   Caption        =  "Starting Time"
   BeginProperty Font
      name           =  "MS Sans Serif"
      charset        =  222
      weight         =  700
      size           =  8.25
      underline      =  0   'False
      italic         =  0   'False
      strikethrough  =  0   'False
   EndProperty
```

```
    Height          =  255
    Left            =  4080
    TabIndex        =  3
    Top             =  0
    Width           =  1470
  End
  Begin MSGrid.Grid Table
    Height          =  1335
    Left            =  120
    TabIndex        =  2
    Top             =  480
    Width           =  4815
    _Version        =  65536
    _ExtentX        =  8493
    _ExtentY        =  2355
    _StockProps     =  77
    BackColor       =  16777215
    BeginProperty Font {0BE35203-8F91-11CE-9DE3-00AA004BB851}
      name          =  "MS Sans Serif"
      charset       =  222
      weight        =  700
      size          =  8.25
      underline     =  0   'False
      italic        =  0   'False
      strikethrough =  0   'False
    EndProperty
    BorderStyle     =  0
    Rows            =  1
    Cols            =  7
    FixedRows       =  0
    FixedCols       =  0
    ScrollBars      =  2
  End
  Begin VB.Label Border
    BorderStyle     =  1  'Fixed Single
    BeginProperty Font
      name          =  "MS Sans Serif"
      charset       =  222
      weight        =  700
      size          =  8.25
      underline     =  0   'False
      italic        =  0   'False
      strikethrough =  0   'False
    EndProperty
    Height          =  2655
    Left            =  0
    TabIndex        =  1
    Top             =  360
    Width           =  6135
  End
End
Attribute VB_Name = "RescheduleTable"
Attribute VB_Creatable = False
Attribute VB_Exposed = False
Sub Fill_Table()
```

```
Dim NJob, repl As Integer

NJob = 32700
repl = 0
Table.ColAlignment(0) = 1
Table.ColAlignment(1) = 0
Table.ColAlignment(2) = 0
Table.ColAlignment(3) = 0
Table.ColAlignment(4) = 1
Table.ColAlignment(5) = 1
Table.ColAlignment(6) = 1
Dat.job.Recordset.MoveLast
Dat.process.Recordset.MoveLast
Dat.datas.Recordset.MoveLast
Dat.job.Recordset.MoveFirst
Dat.process.Recordset.MoveFirst
Dat.datas.Recordset.MoveFirst
Table.Rows = Dat.process.Recordset.RecordCount
For i = 0 To Dat.process.Recordset.RecordCount - 1
    Dat.process.Recordset.AbsolutePosition = i
    Dat.datas.Recordset.AbsolutePosition = i
    Table.Row = i + repl
    If Dat.process.Recordset("job_number") <> NJob Then
        NJob = Dat.process.Recordset("job_number")
        If i <> 0 Then Dat.job.Recordset.MoveNext
        Table.Col = 0
        Table.Text = Dat.job.Recordset.AbsolutePosition + 1
        Table.Col = 1
        Table.Text = Dat.job.Recordset("job_name")
    Else
        Table.Col = 0
        Table.Text = ""
        Table.Col = 1
        Table.Text = ""
    End If
    Table.Col = 2
    Table.Text = Dat.process.Recordset("process_name")
    If Dat.datas.Recordset("rstart") < Dat.datas.Recordset("rend") Then
        Table.Col = 3
        Table.Text = Dat.process.Recordset("machine_name")
        Table.Col = 4
        Table.Text = Format(Dat.datas.Recordset("rstart"), "#,##0.00")
        Table.Col = 5
        Table.Text = Format(Dat.datas.Recordset("rend"), "#,##0.00")
        Table.Col = 6
        Table.Text = Format(Dat.datas.Recordset("rend") - Dat.datas.Recordset("rstart"), "#,##0.00")
    Else
        repl = repl - 1
    End If
    If (Dat.Replace.Recordset.RecordCount > 0) And (Dat.datas.Recordset("rend") -
Dat.datas.Recordset("rstart") < Dat.process.Recordset("processing_time")) Then
        repl = repl + 1
        tkeys = "operation = " & Str(i)
        Dat.Replace.Recordset.FindFirst tkeys
        If Not (Dat.Replace.Recordset.NoMatch) Then
```

```
                If Dat.datas.Recordset("rstart") < Dat.datas.Recordset("rend") Then
                    Table.AddItem Table.Rows
                    Table.Row = i + repl
                    Table.Col = 0
                    Table.Text = ""
                    Table.Col = 1
                    Table.Text = ""
                    Table.Col = 2
                    Table.Text = ""
                End If
                If Dat.Replace.Recordset("rstart") < Dat.datas.Recordset("rstart") Then
                    Table.Col = 3
                    Table.Text = Dat.process.Recordset("machine_name")
                    Table.Col = 4
                    Table.Text = Format(Dat.datas.Recordset("rstart"), "#,##0.00")
                    Table.Col = 5
                    Table.Text = Format(Dat.datas.Recordset("rend"), "#,##0.00")
                    Table.Col = 6
                    Table.Text = Format(Dat.datas.Recordset("rend") - Dat.datas.Recordset("rstart"), "#,##0.00")
                    Table.Row = i + repl - 1
                    Dat.machine.Recordset.AbsolutePosition = Dat.Replace.Recordset("machine_num")
                    Table.Col = 3
                    Table.Text = Dat.machine.Recordset("machine_name")
                    Table.Col = 4
                    Table.Text = Format(Dat.Replace.Recordset("rstart"), "#,##0.00")
                    Table.Col = 5
                    Table.Text = Format(Dat.Replace.Recordset("rstop"), "#,##0.00")
                    Table.Col = 5
                    Table.Text = Format(Dat.Replace.Recordset("rstop"), "#,##0.00")
                    Table.Col = 6
                    Table.Text = Format(Dat.Replace.Recordset("rstop") - Dat.Replace.Recordset("rstart"), "#,##0.00")
                Else
                    Dat.machine.Recordset.AbsolutePosition = Dat.Replace.Recordset("machine_num")
                    Table.Col = 3
                    Table.Text = Dat.machine.Recordset("machine_name")
                    Table.Col = 4
                    Table.Text = Format(Dat.Replace.Recordset("rstart"), "#,##0.00")
                    Table.Col = 5
                    Table.Text = Format(Dat.Replace.Recordset("rstop"), "#,##0.00")
                    Table.Col = 6
                    Table.Text = Format(Dat.Replace.Recordset("rstop") - Dat.Replace.Recordset("rstart"), "#,##0.00")
                End If
            Else
                repl = repl - 1
            End If
        End If
    Next i
End Sub

Sub Arrange_form()
    Border.Left = 90
    Border.Top = 300
    Border.Width = RescheduleTable.Width - 320
    Border.Height = RescheduleTable.Height - 1200
    Table.Left = Border.Left + 40
```

```
Table.Top = Border.Top + 40
Table.Width = Border.Width - 80
Table.Height = Border.Height - 80
Quit.Left = Int((RescheduleTable.Width - Quit.Width) / 2)
Quit.Top = RescheduleTable.Height - 820
If Table.Height > (Table.RowHeight(0) + 15) * Table.Rows Then
    Label6.Top = 10
    Label6.Width = 500
    Label6.Left = 100
    Label7.Top = Label6.Top
    Label7.Width = 1400
    Label7.Left = RescheduleTable.Width - Label7.Width - 220
    Label5.Top = Label6.Top
    Label5.Width = 1400
    Label5.Left = Label7.Left - Label5.Width - 20
    Label4.Top = Label6.Top
    Label4.Width = 1400
    Label4.Left = Label5.Left - Label4.Width - 20
    temp = Int((Label4.Left - 1000) / 3)
    Label3.Top = Label6.Top
    Label3.Width = temp
    Label3.Left = Label4.Left - temp - 20
    temp = Int((Label3.Left - 1000) / 2)
    Label2.Top = Label6.Top
    Label2.Width = temp
    Label2.Left = Label3.Left - temp - 20
    Label1.Top = Label6.Top
    Label1.Width = Label2.Left - 630
    Label1.Left = 610
    Table.ColWidth(0) = Label6.Width - 30
    Table.ColWidth(1) = Label1.Width
    Table.ColWidth(2) = Label2.Width
    Table.ColWidth(3) = Label3.Width
    Table.ColWidth(4) = Label4.Width
    Table.ColWidth(5) = Label5.Width
    Table.ColWidth(6) = Label7.Width - 30
Else
    Label6.Top = 10
    Label6.Width = 500
    Label6.Left = 100
    Label7.Top = Label6.Top
    Label7.Width = 1400
    Label7.Left = RescheduleTable.Width - Label7.Width - 480
    Label5.Top = Label6.Top
    Label5.Width = 1400
    Label5.Left = Label7.Left - Label5.Width - 20
    Label4.Top = Label6.Top
    Label4.Width = 1400
    Label4.Left = Label5.Left - Label4.Width - 20
    temp = Int((Label4.Left - 1000) / 3)
    Label3.Top = Label6.Top
    Label3.Width = temp
    Label3.Left = Label4.Left - temp - 20
    temp = Int((Label3.Left - 1000) / 2)
    Label2.Top = Label6.Top
```

```
        Label2.Width = temp
        Label2.Left = Label3.Left - temp - 20
        Label1.Top = Label6.Top
        Label1.Width = Label2.Left - 630
        Label1.Left = 610
        Table.ColWidth(0) = Label6.Width - 30
        Table.ColWidth(1) = Label1.Width
        Table.ColWidth(2) = Label2.Width
        Table.ColWidth(3) = Label3.Width
        Table.ColWidth(4) = Label4.Width
        Table.ColWidth(5) = Label5.Width
        Table.ColWidth(6) = Label7.Width - 25
    End If
End Sub
Private Sub Form_Activate()
    Arrange_form
End Sub

Private Sub Form_Resize()
    If RescheduleTable.WindowState <> 1 Then
        If RescheduleTable.Width < 9000 Then RescheduleTable.Width = 9000
        If RescheduleTable.Height < 3000 Then RescheduleTable.Height = 3000
        Arrange_form
    End If
End Sub


Private Sub Form_Unload(Cancel As Integer)
    RescheduleTable.Enabled = False
    RescheduleTable.Visible = False
    Unload RescheduleTable
    Main.Enabled = True
    Main.Visible = True
End Sub


Private Sub Quit_Click()
    RescheduleTable.Enabled = False
    RescheduleTable.Visible = False
    Unload RescheduleTable
    Main.Enabled = True
    Main.Visible = True
End Sub
```

```
VERSION 4.00
Begin VB.Form ResOption
   Caption         =  "Reschduling Generation Option"
   ClientHeight    =  3060
   ClientLeft      =  2445
   ClientTop       =  2790
   ClientWidth     =  4950
   Height          =  3465
   Left            =  2385
   LinkTopic       =  "Form1"
   ScaleHeight     =  3060
   ScaleWidth      =  4950
   Top             =  2445
   Visible         =  0   'False
   Width           =  5070
   Begin VB.Frame Frame1
      Caption         =  "Options"
      BeginProperty Font
         name            =  "MS Sans Serif"
         charset         =  222
         weight          =  700
         size            =  8.25
         underline       =  0   'False
         italic          =  0   'False
         strikethrough   =  0   'False
      EndProperty
      Height          =  2055
      Left            =  720
      TabIndex        =  2
      Top             =  120
      Width           =  3495
      Begin VB.OptionButton ResumeOp
         Caption         =  "Resume"
         BeginProperty Font
            name            =  "MS Sans Serif"
            charset         =  222
            weight          =  700
            size            =  8.25
            underline       =  0   'False
            italic          =  0   'False
            strikethrough   =  0   'False
         EndProperty
         Height          =  375
         HelpContextID   =  3
         Left            =  1080
         TabIndex        =  4
         Top             =  480
         Value           =  -1  'True
         Width           =  1335
      End
      Begin VB.OptionButton RepeatOp
         Caption         =  "Repeat"
         BeginProperty Font
            name            =  "MS Sans Serif"
            charset         =  222
```

```
      weight         =  700
      size           =  8.25
      underline      =  0   'False
      italic         =  0   'False
      strikethrough  =  0   'False
    EndProperty
    Height         =  375
    Left           =  1080
    TabIndex       =  3
    Top            =  1320
    Width          =  1335
  End
End
Begin VB.CommandButton Ok
  Caption        =  "&Ok"
  BeginProperty Font
    name           =  "MS Sans Serif"
    charset        =  222
    weight         =  700
    size           =  8.25
    underline      =  0   'False
    italic         =  0   'False
    strikethrough  =  0   'False
  EndProperty
  Height         =  375
  Left           =  720
  TabIndex       =  1
  Top            =  2520
  Width          =  1455
End
Begin VB.CommandButton Cancel
  Caption        =  "&Cancel"
  BeginProperty Font
    name           =  "MS Sans Serif"
    charset        =  222
    weight         =  700
    size           =  8.25
    underline      =  0   'False
    italic         =  0   'False
    strikethrough  =  0   'False
  EndProperty
  Height         =  375
  Left           =  2760
  TabIndex       =  0
  Top            =  2520
  Width          =  1455
End
Attribute VB_Name = "ResOption"
Attribute VB_Creatable = False
Attribute VB_Exposed = False
Private Sub Cancel_Click()
  ResOption.Enabled = False
  ResOption.Visible = False
  Unload ResOption
```

```
    Main.SetFocus
End Sub

Private Sub Form_Load()
    If Repeat Then
        ResumeOp.Value = False
        RepeatOp.Value = True
    Else
        ResumeOp.Value = True
        RepeatOp.Value = False
    End If
End Sub


Private Sub Ok_Click()
    Randomize
    If RepeatOp.Value Then
        Repeat = True
    Else
        Repeat = False
    End If
    ResOption.Enabled = False
    ResOption.Visible = False
    Unload ReplaceOp
    ReplaceOp.Enabled = True
    ReplaceOp.Visible = True
    ReplaceOp.SetFocus
End Sub
```

```
VERSION 4.00
Begin VB.Form RJobChart
   AutoRedraw      =  -1  'True
   Caption         =  "Rescheduling Job Chart"
   ClientHeight    =  5385
   ClientLeft      =  3570
   ClientTop       =  3030
   ClientWidth     =  6765
   BeginProperty Font
      name           =  "MS Sans Serif"
      charset        =  222
      weight         =  700
      size           =  8.25
      underline      =  0   'False
      italic         =  0   'False
      strikethrough  =  0   'False
   EndProperty
   Height          =  5790
   Left            =  3510
   LinkTopic       =  "Form1"
   ScaleHeight     =  5385
   ScaleWidth      =  6765
   Top             =  2685
   Width           =  6885
   Begin VB.CommandButton Obj
      Height          =  375
      Left            =  2280
      TabIndex        =  2
      Top             =  1920
      Visible         =  0   'False
      Width           =  855
   End
   Begin VB.PictureBox Graph
      AutoRedraw      =  -1  'True
      Height          =  4710
      Left            =  360
      ScaleHeight     =  4650
      ScaleWidth      =  5985
      TabIndex        =  1
      Top             =  120
      Width           =  6045
   End
```

```
  Begin VB.CommandButton Quit
    Caption        =  "&Close"
    Height         =  405
    Left           =  2760
    TabIndex       =  0
    Top            =  4920
    Width          =  1215
  End
End
Attribute VB_Name = "RJobChart"
Attribute VB_Creatable = False
Attribute VB_Exposed = False
Public X_size, Y_size As Long
Public Oper_Point, Least As Integer
Public Old_Y As Long
Sub Arrange_Form()
   Graph.Left = 500
   Graph.Top = 200
   Graph.Width = RJobChart.Width - 700
   Graph.Height = RJobChart.Height - 1400
   Quit.Left = (RJobChart.Width - Quit.Width) \ 2
   Quit.Top = RJobChart.Height - 820
   Output
End Sub

Sub Out_Box(bx, by, bwidth, bheight As Long, boolor As Long, Dat As String)
   Graph.CurrentX = bx
   Graph.CurrentY = by
   Graph.Line Step(0, 0)-Step(bwidth, bheight), boolor, BF
   Graph.Line Step(0, 0)-Step(-bwidth, 0), QBColor(0), BF
   Graph.Line Step(0, 0)-Step(0, -bheight), QBColor(15), BF
   Graph.Line Step(0, 0)-Step(bwidth, 0), QBColor(15), BF
   Graph.Line Step(0, 0)-Step(0, bheight), QBColor(0), BF
   Graph.CurrentX = bx + Int((bwidth - (Len(Dat) * 170)) / 2)
   Graph.CurrentY = by + Int((bheight - 10) / 2)
   Graph.Print Dat
End Sub

Sub Output()
   Dim pX, py, pw As Long
   Dim Current, ScaleStep As Integer
```

```
    Randomize
    Graph.ForeColor = 0
    X_size = Int((Graph.Width - 70) / RMax_Time)
    Y_size = Int((Graph.Height - 100) / Dat.job.Recordset.RecordCount)
    Dat.process.Recordset.MoveFirst
    Dat.job.Recordset.MoveFirst
    Current = Dat.process.Recordset("job_number")
    Graph.Cls
    RJobChart.Cls
    For i = 0 To Dat.datas.Recordset.RecordCount - 1
        Dat.datas.Recordset.AbsolutePosition = i
        Dat.process.Recordset.AbsolutePosition = i
        If Current <> Dat.process.Recordset("job_number") Then
            Current = Dat.process.Recordset("job_number")
            Dat.job.Recordset.MoveNext
        End If
        pX = Dat.datas.Recordset("rstart") * X_size
        py = (Dat.job.Recordset.AbsolutePosition) * Y_size
        pw = (Dat.datas.Recordset("rend") - Dat.datas.Recordset("rstart")) * X_size
        If Y_size > 720 Then
            Out_Box pX, py + ((Y_size - 720) \ 2), pw - 16, 700, QBColor(Dat.datas.Recordset("machine_number") +
1), Dat.datas.Recordset("Machine_Number") + 1
        Else
            Out_Box pX, py, pw - 16, Y_size - 10, QBColor(Dat.datas.Recordset("machine_number") + 1),
Dat.datas.Recordset("machine_number") + 1
        End If
    Next i
    If Dat.replace.Recordset.RecordCount > 0 Then
        Dat.replace.Recordset.MoveLast
        For i = 0 To Dat.replace.Recordset.RecordCount - 1
            Dat.replace.Recordset.AbsolutePosition = i
            Dat.datas.Recordset.AbsolutePosition = Dat.replace.Recordset("operation")
            Dat.process.Recordset.AbsolutePosition = Dat.replace.Recordset("operation")
            tkey = "job_number = " + Str(Dat.process.Recordset("job_number"))
            Dat.job.Recordset.FindFirst tkey
            pX = Dat.replace.Recordset("rstart") * X_size
            py = (Dat.job.Recordset.AbsolutePosition) * Y_size
            pw = (Dat.replace.Recordset("rstop") - Dat.replace.Recordset("rstart")) * X_size
            If Y_size > 720 Then
                Out_Box pX, py + ((Y_size - 720) \ 2), pw - 16, 700, QBColor(Dat.replace.Recordset("machine_num")
+ 1), Dat.replace.Recordset("Machine_num") + 1
            Else
```

```
            Out_Box pX, py, pw - 16, Y_size - 10, QBColor(Dat.replace.Recordset("machine_num") + 1),
'Dat.replace.Recordset("machine_num") + 1
          End If
        Next i
      End If
      py = Graph.Top + Graph.Height
      i = 0
      ScaleStep = 800 \ X_size
      If ScaleStep = 0 Then ScaleStep = 1
      While i <= RMax_Time
        RJobChart.CurrentX = i * X_size + 520
        RJobChart.CurrentY = py
        RJobChart.Line Step(0, 0)-Step(0, 50), QBColor(0), BF
        temp = Str(i)
        temp = Right(temp, Len(temp) - 1)
        RJobChart.CurrentX = RJobChart.CurrentX - Int((Len(temp) * 170) / 2)
        RJobChart.CurrentY = py + 70
        RJobChart.Print temp
        i = i + ScaleStep
      Wend
      For i = 1 To Dat.job.Recordset.RecordCount
        RJobChart.CurrentX = 20
        RJobChart.CurrentY = i * Y_size - Int(Y_size / 2)
        RJobChart.Print i
      Next i
End Sub

Private Sub Form_Resize()
    If RJobChart.WindowState <> 1 Then
        If RJobChart.Height < (2500 + Dat.job.Recordset.RecordCount * 300) Then
            RJobChart.Height = (2500 + Dat.job.Recordset.RecordCount * 300)
        End If
        If RJobChart.Width < 6500 Then
            RJobChart.Width = 6500
        End If
        Arrange_Form
    End If
End Sub


Private Sub Form_Unload(Cancel As Integer)
    RJobChart.Enabled = False
```

```
    RJobChart.Visible = False
    Unload RJobChart
End Sub


Private Sub Graph_MouseDown(Button As Integer, Shift As Integer, X As Single, Y As Single)
    Dim tY, tX As Double
    Dim aY As Integer
    Dim aX As Single
    Dim found As Boolean
    Dim message As String

    Graph.CurrentX = X
    Graph.CurrentY = Y
    If Button > 1 Then
        aY = Int(Graph.CurrentY / Y_size)
        temp = aY * Y_size + ((Y_size - 520) \ 2)
        If (Graph.CurrentY > temp) And (Graph.CurrentY < temp + 500) Then
            Dat.job.Recordset.AbsolutePosition = aY
            temp = Dat.job.Recordset("job_number")
            aX = Graph.CurrentX / X_size
            Dat.datas.Recordset.MoveFirst
            Dat.process.Recordset.MoveFirst
            found = False
            Do
                If (Dat.datas.Recordset("rstart") < aX) And (aX < Dat.datas.Recordset("rend")) And
(Dat.process.Recordset("job_number") = temp) Then
                    found = True
                    Exit Do
                Else
                    If (Dat.datas.Recordset.AbsolutePosition >= Dat.datas.Recordset.RecordCount - 1) Then
                        Exit Do
                    End If
                End If
                Dat.datas.Recordset.MoveNext
                Dat.process.Recordset.MoveNext
            Loop Until (found)
            If Not (found) Then
                Dat.replace.Recordset.MoveFirst
                Do
                    If (Dat.replace.Recordset("rstart") < aX) And (aX < Dat.replace.Recordset("rstop")) Then
                        Dat.process.Recordset.AbsolutePosition = Dat.replace.Recordset("operation")
```

```
                If (Dat.process.Recordset("job_number") = temp) Then
                    found = True
                    Exit Do
                End If
            Else
                If (Dat.replace.Recordset.AbsolutePosition >= Dat.replace.Recordset.RecordCount - 1) Then
                    Exit Do
                End If
            End If
            Dat.replace.Recordset.MoveNext
        Loop Until (found)
        If found Then
            Dat.process.Recordset.AbsolutePosition = Dat.replace.Recordset("operation")
            temp = "Job_number = " + Str(Dat.process.Recordset("Job_number"))
            Dat.job.Recordset.FindFirst temp
            m1 = "Job                    " & Dat.job.Recordset("job_name") & Chr(10) & Chr(13)
            m2 = "Opertion               " & Dat.process.Recordset("process_name") & Chr(10) & Chr(13)
            m3 = "Machine                " & Dat.process.Recordset("machine_name") & Chr(10) &
Chr(13)
            m4 = "Start                  " & Format(Dat.replace.Recordset("rstart"), "#,##0.00") &
Chr(10) & Chr(13)
            m5 = "End                    " & Format(Dat.replace.Recordset("rstop"), "#,##0.00") &
Chr(10) & Chr(13)
            m6 = "Processing Time        " & Format(Dat.replace.Recordset("rstop") -
Dat.replace.Recordset("rstart"), "#,##0.00") & Chr(10) & Chr(13)
            message = m1 & m2 & m3 & m4 & m5 & m6
            temp = MsgBox(message, vbOKOnly, "Data")
        End If
        found = False
    End If
    If found Then
        Dat.process.Recordset.AbsolutePosition = Dat.datas.Recordset.AbsolutePosition
        temp = "Job_number = " + Str(Dat.process.Recordset("Job_number"))
        Dat.job.Recordset.FindFirst temp
        m1 = "Job                    " & Dat.job.Recordset("job_name") & Chr(10) & Chr(13)
        m2 = "Opertion               " & Dat.process.Recordset("process_name") & Chr(10) & Chr(13)
        m3 = "Machine                " & Dat.process.Recordset("machine_name") & Chr(10) & Chr(13)
        m4 = "Start                  " & Format(Dat.datas.Recordset("rstart"), "#,##0.00") & Chr(10) &
Chr(13)
        m5 = "End                    " & Format(Dat.datas.Recordset("rend"), "#,##0.00") & Chr(10) &
Chr(13)
```

```
            m6 = "Processing Time         " & Format(Dat.datas.Recordset("rend") -
Dat.datas.Recordset("rstart"), "#,##0.00") & Chr(10) & Chr(13)
            message = m1 & m2 & m3 & m4 & m5 & m6
            temp = MsgBox(message, vbOKOnly, "Data")
         End If
      End If
   Else
      tY = Int(Graph.CurrentY / Y_size)
      temp = tY * Y_size + ((Y_size - 520) \ 2)
      If (Graph.CurrentY > temp) And (Graph.CurrentY < temp + 500) Then
         Dat.job.Recordset.AbsolutePosition = tY
         tkey = "job_number = " + Str(Dat.job.Recordset("job_number"))
         Dat.process.Recordset.FindFirst tkey
         Dat.datas.Recordset.MoveLast
         Dat.datas.Recordset.AbsolutePosition = Dat.process.Recordset.AbsolutePosition
         tX = Graph.CurrentX / X_size
         found = False
         Do
            If (Dat.datas.Recordset("rstart") < tX) And (tX < Dat.datas.Recordset("rend")) Then
               found = True
               temp = Dat.process.Recordset("job_number")
               If Dat.process.Recordset.AbsolutePosition > 0 Then
                  Dat.process.Recordset.MovePrevious
                  If Dat.process.Recordset("job_number") = temp Then
                     Dat.datas.Recordset.MovePrevious
                     Least = Dat.datas.Recordset("rend")
                     Dat.datas.Recordset.MoveNext
                  Else
                     Least = 0
                  End If
                  Dat.process.Recordset.MoveNext
               Else
                  Least = 0
               End If
               Graph.MousePointer = 2
               Oper_Point = Dat.datas.Recordset.AbsolutePosition
               pX = Dat.datas.Recordset("rstart") * X_size
               py = Dat.job.Recordset.AbsolutePosition * Y_size
               pw = Dat.process.Recordset("processing_time") * X_size
               Obj.Left = Graph.Left + pX + 30
               Old_Y = Obj.Top
               Obj.Top = Graph.Top + py + ((Y_size - 720) \ 2) + 25
```

```
                Obj.Width = pw - 16
                Obj.Height = 720
                Obj.Caption = Dat.datas.Recordset("process_id")
                Obj.Visible = True
                Exit Do
            Else
                If (Dat.datas.Recordset.AbsolutePosition >= Dat.datas.Recordset.RecordCount - 1) Or
(Dat.process.Recordset("job_number") <> Dat.job.Recordset("job_number")) Then
                    Exit Do
                End If
            End If
            Dat.process.Recordset.MoveNext
            Dat.datas.Recordset.MoveNext
        Loop Until (found)
    End If
  End If
End Sub


Private Sub Graph_MouseMove(Button As Integer, Shift As Integer, X As Single, Y As Single)
  If Obj.Visible Then
    temp = X \ X_size
    If temp < Least Then temp = Least
    If temp > RMax_Time Then temp = RMax_Time
    Obj.Left = Graph.Left + 30 + temp * X_size
  End If
End Sub


Private Sub Graph_MouseUp(Button As Integer, Shift As Integer, X As Single, Y As Single)
  Dim pX As Double
  Dim tX As Integer

  Dat.datas.Recordset.AbsolutePosition = Oper_Point
  tX = Int((Obj.Left - Graph.Left) / X_size)
  If Dat.datas.Recordset("rstart") <> tX Then
    Beep
    RChange_Prepare Oper_Point, tX
    RReArrange
    Gen_RPerformance
    RescheduleTable.Fill_Table
    RTable.Fill_Table
```

```
        RMcTable.Fill_Table
    End If
    Graph.MousePointer = 1
    Obj.Visible = False
    Output
End Sub


Private Sub Quit_Click()
    RJobChart.Enabled = False
    RJobChart.Visible = False
    Unload RJobChart
End Sub
```

```
VERSION 4.00
Begin VB.Form RJobChart
   AutoRedraw      =  -1  'True
   Caption         =  "Rescheduling Job Chart"
   ClientHeight    =  5385
   ClientLeft      =  3570
   ClientTop       =  3030
   ClientWidth     =  6765
   BeginProperty Font
      name            =  "MS Sans Serif"
      charset         =  222
      weight          =  700
      size            =  8.25
      underline       =  0   'False
      italic          =  0   'False
      strikethrough   =  0   'False
   EndProperty
   Height          =  5790
   Left            =  3510
   LinkTopic       =  "Form1"
   ScaleHeight     =  5385
   ScaleWidth      =  6765
   Top             =  2685
   Width           =  6885
   Begin VB.CommandButton Obj
      Height          =  375
      Left            =  2280
      TabIndex        =  2
      Top             =  1920
      Visible         =  0   'False
      Width           =  855
   End
   Begin VB.PictureBox Graph
      AutoRedraw      =  -1  'True
      Height          =  4710
      Left            =  360
      ScaleHeight     =  4650
      ScaleWidth      =  5985
      TabIndex        =  1
      Top             =  120
      Width           =  6045
   End
   Begin VB.CommandButton Quit
      Caption         =  "&Close"
      Height          =  405
      Left            =  2760
      TabIndex        =  0
      Top             =  4920
      Width           =  1215
   End
End
Attribute VB_Name = "RJobChart"
Attribute VB_Creatable = False
Attribute VB_Exposed = False
Public X_size, Y_size As Long
```

```
Public Oper_Point, Least As Integer
Public Old_Y As Long
Sub Arrange_Form()
    Graph.Left = 500
    Graph.Top = 200
    Graph.Width = RJobChart.Width - 700
    Graph.Height = RJobChart.Height - 1400
    Quit.Left = (RJobChart.Width - Quit.Width) \ 2
    Quit.Top = RJobChart.Height - 820
    Output
End Sub

Sub Out_Box(bx, by, bwidth, bheight As Long, boolor As Long, Dat As String)
    Graph.CurrentX = bx
    Graph.CurrentY = by
    Graph.Line Step(0, 0)-Step(bwidth, bheight), boolor, BF
    Graph.Line Step(0, 0)-Step(-bwidth, 0), QBColor(0), BF
    Graph.Line Step(0, 0)-Step(0, -bheight), QBColor(15), BF
    Graph.Line Step(0, 0)-Step(bwidth, 0), QBColor(15), BF
    Graph.Line Step(0, 0)-Step(0, bheight), QBColor(0), BF
    Graph.CurrentX = bx + Int((bwidth - (Len(Dat) * 170)) / 2)
    Graph.CurrentY = by + Int((bheight - 10) / 2)
    Graph.Print Dat
End Sub

Sub Output()
    Dim pX, py, pw As Long
    Dim Current, ScaleStep As Integer

    Randomize
    Graph.ForeColor = 0
    X_size = Int((Graph.Width - 70) / RMax_Time)
    Y_size = Int((Graph.Height - 100) / Dat.job.Recordset.RecordCount)
    Dat.process.Recordset.MoveFirst
    Dat.job.Recordset.MoveFirst
    Current = Dat.process.Recordset("job_number")
    Graph.Cls
    RJobChart.Cls
    For i = 0 To Dat.datas.Recordset.RecordCount - 1
        Dat.datas.Recordset.AbsolutePosition = i
        Dat.process.Recordset.AbsolutePosition = i
        If Current <> Dat.process.Recordset("job_number") Then
            Current = Dat.process.Recordset("job_number")
            Dat.job.Recordset.MoveNext
        End If
        pX = Dat.datas.Recordset("rstart") * X_size
        py = (Dat.job.Recordset.AbsolutePosition) * Y_size
        pw = (Dat.datas.Recordset("rend") - Dat.datas.Recordset("rstart")) * X_size
        If Y_size > 720 Then
            Out_Box pX, py + ((Y_size - 720) \ 2), pw - 16, 700, QBColor(Dat.datas.Recordset("machine_number") +
1), Dat.datas.Recordset("Machine_Number") + 1
        Else
            Out_Box pX, py, pw - 16, Y_size - 10, QBColor(Dat.datas.Recordset("machine_number") + 1),
Dat.datas.Recordset("machine_number") + 1
        End If
```

```
    Next i
    If Dat.replace.Recordset.RecordCount > 0 Then
        Dat.replace.Recordset.MoveLast
        For i = 0 To Dat.replace.Recordset.RecordCount - 1
            Dat.replace.Recordset.AbsolutePosition = i
            Dat.datas.Recordset.AbsolutePosition = Dat.replace.Recordset("operation")
            Dat.process.Recordset.AbsolutePosition = Dat.replace.Recordset("operation")
            tkey = "job_number = " + Str(Dat.process.Recordset("job_number"))
            Dat.job.Recordset.FindFirst tkey
            pX = Dat.replace.Recordset("rstart") * X_size
            py = (Dat.job.Recordset.AbsolutePosition) * Y_size
            pw = (Dat.replace.Recordset("rstop") - Dat.replace.Recordset("rstart")) * X_size
            If Y_size > 720 Then
                Out_Box pX, py + ((Y_size - 720) \ 2), pw - 16, 700, QBColor(Dat.replace.Recordset("machine_num")
+ 1), Dat.replace.Recordset("Machine_num") + 1
            Else
                Out_Box pX, py, pw - 16, Y_size - 10, QBColor(Dat.replace.Recordset("machine_num") + 1),
Dat.replace.Recordset("machine_num") + 1
            End If
        Next i
    End If
    py = Graph.Top + Graph.Height
    i = 0
    ScaleStep = 800 \ X_size
    If ScaleStep = 0 Then ScaleStep = 1
    While i <= RMax_Time
        RJobChart.CurrentX = i * X_size + 520
        RJobChart.CurrentY = py
        RJobChart.Line Step(0, 0)-Step(0, 50), QBColor(0), BF
        temp = Str(i)
        temp = Right(temp, Len(temp) - 1)
        RJobChart.CurrentX = RJobChart.CurrentX - Int((Len(temp) * 170) / 2)
        RJobChart.CurrentY = py + 70
        RJobChart.Print temp
        i = i + ScaleStep
    Wend
    For i = 1 To Dat.job.Recordset.RecordCount
        RJobChart.CurrentX = 20
        RJobChart.CurrentY = i * Y_size - Int(Y_size / 2)
        RJobChart.Print i
    Next i
End Sub

Private Sub Form_Resize()
    If RJobChart.WindowState <> 1 Then
        If RJobChart.Height < (2500 + Dat.job.Recordset.RecordCount * 300) Then
            RJobChart.Height = (2500 + Dat.job.Recordset.RecordCount * 300)
        End If
        If RJobChart.Width < 6500 Then
            RJobChart.Width = 6500
        End If
        Arrange_Form
    End If
End Sub
```

```
Private Sub Form_Unload(Cancel As Integer)
    RJobChart.Enabled = False
    RJobChart.Visible = False
    Unload RJobChart
End Sub


Private Sub Graph_MouseDown(Button As Integer, Shift As Integer, X As Single, Y As Single)
    Dim tY, tX As Double
    Dim aY As Integer
    Dim aX As Single
    Dim found As Boolean
    Dim message As String

    Graph.CurrentX = X
    Graph.CurrentY = Y
    If Button > 1 Then
        aY = Int(Graph.CurrentY / Y_size)
        temp = aY * Y_size + ((Y_size - 520) \ 2)
        If (Graph.CurrentY > temp) And (Graph.CurrentY < temp + 500) Then
            Dat.job.Recordset.AbsolutePosition = aY
            temp = Dat.job.Recordset("job_number")
            aX = Graph.CurrentX / X_size
            Dat.datas.Recordset.MoveFirst
            Dat.process.Recordset.MoveFirst
            found = False
            Do
                If (Dat.datas.Recordset("rstart") < aX) And (aX < Dat.datas.Recordset("rend")) And
(Dat.process.Recordset("job_number") = temp) Then
                    found = True
                    Exit Do
                Else
                    If (Dat.datas.Recordset.AbsolutePosition >= Dat.datas.Recordset.RecordCount - 1) Then
                        Exit Do
                    End If
                End If
                Dat.datas.Recordset.MoveNext
                Dat.process.Recordset.MoveNext
            Loop Until (found)
            If Not (found) Then
                Dat.replace.Recordset.MoveFirst
                Do
                    If (Dat.replace.Recordset("rstart") < aX) And (aX < Dat.replace.Recordset("rstop")) Then
                        Dat.process.Recordset.AbsolutePosition = Dat.replace.Recordset("operation")
                        If (Dat.process.Recordset("job_number") = temp) Then
                            found = True
                            Exit Do
                        End If
                    Else
                        If (Dat.replace.Recordset.AbsolutePosition >= Dat.replace.Recordset.RecordCount - 1) Then
                            Exit Do
                        End If
                    End If
                    Dat.replace.Recordset.MoveNext
```

```
            Loop Until (found)
            If found Then
               Dat.process.Recordset.AbsolutePosition = Dat.replace.Recordset("operation")
               temp = "Job_number = " + Str(Dat.process.Recordset("Job_number"))
               Dat.job.Recordset.FindFirst temp
               m1 = "Job                    " & Dat.job.Recordset("job_name") & Chr(10) & Chr(13)
               m2 = "Opertion               " & Dat.process.Recordset("process_name") & Chr(10) & Chr(13)
               m3 = "Machine                " & Dat.process.Recordset("machine_name") & Chr(10) &
Chr(13)
               m4 = "Start                  " & Format(Dat.replace.Recordset("rstart"), "#,##0.00") &
Chr(10) & Chr(13)
               m5 = "End                    " & Format(Dat.replace.Recordset("rstop"), "#,##0.00") &
Chr(10) & Chr(13)
               m6 = "Processing Time        " & Format(Dat.replace.Recordset("rstop") -
Dat.replace.Recordset("rstart"), "#,##0.00") & Chr(10) & Chr(13)
               message = m1 & m2 & m3 & m4 & m5 & m6
               temp = MsgBox(message, vbOKOnly, "Data")
            End If
            found = False
         End If
         If found Then
            Dat.process.Recordset.AbsolutePosition = Dat.datas.Recordset.AbsolutePosition
            temp = "Job_number = " + Str(Dat.process.Recordset("Job_number"))
            Dat.job.Recordset.FindFirst temp
            m1 = "Job                    " & Dat.job.Recordset("job_name") & Chr(10) & Chr(13)
            m2 = "Opertion               " & Dat.process.Recordset("process_name") & Chr(10) & Chr(13)
            m3 = "Machine                " & Dat.process.Recordset("machine_name") & Chr(10) & Chr(13)
            m4 = "Start                  " & Format(Dat.datas.Recordset("rstart"), "#,##0.00") & Chr(10) &
Chr(13)
            m5 = "End                    " & Format(Dat.datas.Recordset("rend"), "#,##0.00") & Chr(10) &
Chr(13)
            m6 = "Processing Time        " & Format(Dat.datas.Recordset("rend") -
Dat.datas.Recordset("rstart"), "#,##0.00") & Chr(10) & Chr(13)
            message = m1 & m2 & m3 & m4 & m5 & m6
            temp = MsgBox(message, vbOKOnly, "Data")
         End If
      End If
   Else
      tY = Int(Graph.CurrentY / Y_size)
      temp = tY * Y_size + ((Y_size - 520) \ 2)
      If (Graph.CurrentY > temp) And (Graph.CurrentY < temp + 500) Then
         Dat.job.Recordset.AbsolutePosition = tY
         tkey = "job_number = " + Str(Dat.job.Recordset("job_number"))
         Dat.process.Recordset.FindFirst tkey
         Dat.datas.Recordset.MoveLast
         Dat.datas.Recordset.AbsolutePosition = Dat.process.Recordset.AbsolutePosition
         tX = Graph.CurrentX / X_size
         found = False
         Do
            If (Dat.datas.Recordset("rstart") < tX) And (tX < Dat.datas.Recordset("rend")) Then
               found = True
               temp = Dat.process.Recordset("job_number")
               If Dat.process.Recordset.AbsolutePosition > 0 Then
                  Dat.process.Recordset.MovePrevious
                  If Dat.process.Recordset("job_number") = temp Then
```

```
                    Dat.datas.Recordset.MovePrevious
                    Least = Dat.datas.Recordset("rend")
                    Dat.datas.Recordset.MoveNext
                  Else
                    Least = 0
                  End If
                  Dat.process.Recordset.MoveNext
                Else
                  Least = 0
                End If
                Graph.MousePointer = 2
                Oper_Point = Dat.datas.Recordset.AbsolutePosition
                pX = Dat.datas.Recordset("rstart") * X_size
                py = Dat.job.Recordset.AbsolutePosition * Y_size
                pw = Dat.process.Recordset("processing_time") * X_size
                Obj.Left = Graph.Left + pX + 30
                Old_Y = Obj.Top
                Obj.Top = Graph.Top + py + ((Y_size - 720) \ 2) + 25
                Obj.Width = pw - 16
                Obj.Height = 720
                Obj.Caption = Dat.datas.Recordset("process_id")
                Obj.Visible = True
                Exit Do
              Else
                If (Dat.datas.Recordset.AbsolutePosition >= Dat.datas.Recordset.RecordCount - 1) Or
(Dat.process.Recordset("job_number") <> Dat.job.Recordset("job_number")) Then
                  Exit Do
                End If
              End If
              Dat.process.Recordset.MoveNext
              Dat.datas.Recordset.MoveNext
            Loop Until (found)
          End If
        End If
End Sub


Private Sub Graph_MouseMove(Button As Integer, Shift As Integer, X As Single, Y As Single)
    If Obj.Visible Then
        temp = X \ X_size
        If temp < Least Then temp = Least
        If temp > RMax_Time Then temp = RMax_Time
        Obj.Left = Graph.Left + 30 + temp * X_size
    End If
End Sub


Private Sub Graph_MouseUp(Button As Integer, Shift As Integer, X As Single, Y As Single)
    Dim pX As Double
    Dim tX As Integer

    Dat.datas.Recordset.AbsolutePosition = Oper_Point
    tX = Int((Obj.Left - Graph.Left) / X_size)
    If Dat.datas.Recordset("rstart") <> tX Then
        Beep
```

```
        RChange_Prepare Oper_Point, tX
        RReArrange
        Gen_RPerformance
        RescheduleTable.Fill_Table
        RTable.Fill_Table
        RMcTable.Fill_Table
    End If
    Graph.MousePointer = 1
    Obj.Visible = False
    Output
End Sub


Private Sub Quit_Click()
    RJobChart.Enabled = False
    RJobChart.Visible = False
    Unload RJobChart
End Sub
```

```
VERSION 4.00
Begin VB.Form RJobChart
   AutoRedraw      =  -1  'True
   Caption         =  "Rescheduling Job Chart"
   ClientHeight    =  5025
   ClientLeft      =  1605
   ClientTop       =  1890
   ClientWidth     =  6450
   BeginProperty Font
      name            =  "MS Sans Serif"
      charset         =  222
      weight          =  700
      size            =  8.25
      underline       =  0  'False
      italic          =  0  'False
      strikethrough   =  0  'False
   EndProperty
   Height          =  5430
   Left            =  1545
   LinkTopic       =  "Form1"
   ScaleHeight     =  5025
   ScaleWidth      =  6450
   Top             =  1545
   Width           =  6570
   Begin VB.ComboBox Zoom
      Height          =  315
      ItemData        =  "RJobChart.frx":0000
      Left            =  720
      List            =  "RJobChart.frx":0010
      TabIndex        =  7
      Text            =  "Over View"
      Top             =  4560
      Width           =  1455
   End
   Begin VB.HScrollBar Scroll_X
      Height          =  255
      Left            =  600
      TabIndex        =  6
      Top             =  4080
      Visible         =  0  'False
      Width           =  5415
   End
   Begin VB.VScrollBar Scroll_Y
      Height          =  3615
      Left            =  6120
      TabIndex        =  5
      Top             =  360
      Visible         =  0  'False
      Width           =  255
   End
   Begin VB.PictureBox Scale_X
      AutoRedraw      =  -1  'True
      Height          =  255
      Left            =  600
      ScaleHeight     =  195
```

```
    ScaleWidth      =  5475
    TabIndex        =  4
    Top             =  0
    Width           =  5535
  End
  Begin VB.PictureBox Number
    AutoRedraw      =  -1  'True
    Height          =  3615
    Left            =  120
    ScaleHeight     =  3555
    ScaleWidth      =  315
    TabIndex        =  3
    Top             =  360
    Width           =  375
  End
  Begin VB.CommandButton Obj
    Height          =  375
    Left            =  2280
    TabIndex        =  2
    Top             =  1920
    Visible         =  0  'False
    Width           =  855
  End
  Begin VB.PictureBox Graph
    AutoRedraw      =  -1  'True
    Height          =  3630
    Left            =  600
    ScaleHeight     =  3570
    ScaleWidth      =  5385
    TabIndex        =  1
    Top             =  360
    Width           =  5445
  End
  Begin VB.CommandButton Quit
    Caption         =  "&Close"
    Height          =  405
    Left            =  2640
    TabIndex        =  0
    Top             =  4560
    Width           =  1215
  End
  Begin VB.Label Label1
    AutoSize        =  -1  'True
    Caption         =  "Zoom"
    Height          =  195
    Left            =  120
    TabIndex        =  8
    Top             =  4680
    Width           =  465
  End
End
Attribute VB_Name = "RJobChart"
Attribute VB_Creatable = False
Attribute VB_Exposed = False
Dim X_size, Y_size As Long
```

```
Dim Begin_X, Begin_Y As Long
Dim Oper_Point, Least As Integer
Dim Old_Y As Long
Dim first_in As Boolean

Sub Out_LBox(bx, by, bwidth, bheight As Long, bcolor As Long, Dat As String)
    Graph.CurrentX = bx
    Graph.CurrentY = by + 30
    Graph.Line Step(0, 0)-Step(bwidth, bheight - 60), bcolor, BF
    Graph.Line Step(0, 0)-Step(-bwidth, 0), QBColor(12), BF
    Graph.Line Step(0, 0)-Step(0, -bheight + 60), QBColor(15), BF
    Graph.Line Step(0, 0)-Step(bwidth, 0), QBColor(15), BF
    Graph.Line Step(0, 0)-Step(0, bheight - 60), QBColor(12), BF
    Graph.CurrentX = bx + Int((bwidth - (Len(Dat) * 100)) / 2)
    Graph.CurrentY = by + Int((bheight - 180) / 2)
    If Graph.CurrentX > bx Then
       Graph.Print Dat
    End If
End Sub
Sub Arrange_form()
    Scroll_X.Height = 250
    Scroll_Y.Width = 250
    Label1.Left = 100
    Label1.Top = RJobChart.Height - 700
    Zoom.Left = Label1.Left + Label1.Width + 120
    Zoom.Top = Label1.Top - 100
    scale_x.Height = 250
    scale_x.Top = 100
    Number.Left = 100
    Number.Width = 400
    scale_x.Left = Number.Left + Number.Width + 50
    Number.Top = scale_x.Top + scale_x.Height + 50
    Graph.Left = scale_x.Left
    Graph.Top = Number.Top
    Quit.Left = Int((RJobChart.Width - Quit.Width) / 2)
    Quit.Top = RJobChart.Height - 900
    scale_x.Width = RJobChart.Width - Graph.Left - 200
    Number.Height = Quit.Top - Graph.Top - 200
    X_size = Int((Graph.Width - 70) / RMax_Time)
    Y_size = Int((Graph.Height - 60) / Dat.job.Recordset.RecordCount)
    Select Case Zoom.ListIndex
    Case 0 'Over View
       Begin_X = 0
       Begin_Y = 0
       Scroll_X.Visible = False
       Scroll_Y.Visible = False
    Case 1 '200%
       If (X_size < 300) Or (Y_size < 1000) Then
          If Y_size < 1000 Then scale_x.Width = scale_x.Width - 350
          If X_size < 300 Then Number.Height = Number.Height - 350
          If Y_size < 1000 Then
             Y_size = Int((Number.Height - 60) / CInt(Dat.job.Recordset.RecordCount / 2 + 0.005))
             Scroll_Y.Visible = True
             Scroll_Y.Max = Dat.job.Recordset.RecordCount - CInt(Dat.job.Recordset.RecordCount / 2 + 0.006)
             Scroll_Y.LargeChange = CInt(Scroll_Y.Max * 0.11) + 1
```

```
            If Begin_Y > Scroll_Y.Max Then
               Begin_Y = Scroll_Y.Max
            End If
         Else
            Y_size = Int((Number.Height - 60) / Dat.job.Recordset.RecordCount)
            Begin_Y = 0
            Scroll_Y.Visible = False
         End If
         If X_size < 300 Then
            X_size = Int(2 * (scale_x.Width - 70) / (RMax_Time))
            Scroll_X.Visible = True
            Scroll_X.Max = RMax_Time - Int(scale_x.Width / X_size)
            Scroll_X.LargeChange = CInt(Scroll_X.Max * 0.11) + 1
         Else
            X_size = Int((scale_x.Width - 70) / (RMax_Time))
            Begin_X = 0
            Scroll_X.Visible = False
         End If
         Scroll_X.Top = Number.Top + Number.Height + 100
         Scroll_Y.Left = scale_x.Left + scale_x.Width + 100
      Else
         Scroll_X.Visible = False
         Scroll_Y.Visible = False
      End If
   Case 2 '400%
      If (X_size < 300) Or (Y_size < 1000) Then
         If Y_size < 1000 Then scale_x.Width = scale_x.Width - 350
         If X_size < 300 Then Number.Height = Number.Height - 350
         If Y_size < 1000 Then
            Y_size = Int((Number.Height - 60) / CInt(Dat.job.Recordset.RecordCount / 4 + 0.5))
            Scroll_Y.Visible = True
            Scroll_Y.Max = Dat.job.Recordset.RecordCount - CInt(Dat.job.Recordset.RecordCount / 4 + 0.5)
            Scroll_Y.LargeChange = CInt(Scroll_Y.Max * 0.11) + 1
            If Begin_Y > Scroll_Y.Max Then
               Begin_Y = Scroll_Y.Max
            End If
         Else
            Y_size = Int((Number.Height - 60) / Dat.job.Recordset.RecordCount)
            Begin_Y = 0
            Scroll_Y.Visible = False
         End If
         If X_size < 300 Then
            X_size = Int(4 * (scale_x.Width - 70) / (RMax_Time))
            Scroll_X.Visible = True
            Scroll_X.Max = RMax_Time - Int(scale_x.Width / X_size)
            Scroll_X.LargeChange = CInt(Scroll_X.Max * 0.11) + 1
         Else
            X_size = Int((scale_x.Width - 70) / (RMax_Time))
            Begin_X = 0
            Scroll_X.Visible = False
         End If
         Scroll_X.Top = Number.Top + Number.Height + 100
         Scroll_Y.Left = scale_x.Left + scale_x.Width + 100
      Else
         Scroll_X.Visible = False
```

```
            Scroll_Y.Visible = False
        End If
    Case 3 'Detail View
        If (X_size < 300) Or (Y_size < 1000) Then
            If Y_size < 1000 Then scale_x.Width = scale_x.Width - 350
            If X_size < 300 Then Number.Height = Number.Height - 350
            If Y_size < 1000 Then
                temp = Int((Number.Height - 60) / 1000)
                Y_size = Int((Number.Height - 60) / temp)
                Scroll_Y.Visible = True
                Scroll_Y.Max = Dat.job.Recordset.RecordCount - temp
                Scroll_Y.LargeChange = CInt(Scroll_Y.Max * 0.11) + 1
                If Begin_Y > Scroll_Y.Max Then
                    Begin_Y = Scroll_Y.Max
                End If
            Else
                Y_size = Int((Number.Height - 60) / Dat.job.Recordset.RecordCount)
                Begin_Y = 0
                Scroll_Y.Visible = False
            End If
            If X_size < 300 Then
                X_size = 300
                Scroll_X.Visible = True
                Scroll_X.Max = RMax_Time - Int(scale_x.Width / X_size)
                Scroll_X.LargeChange = CInt(Scroll_X.Max * 0.11) + 1
            Else
                X_size = Int((scale_x.Width - 70) / (RMax_Time))
                Begin_X = 0
                Scroll_X.Visible = False
            End If
            Scroll_X.Top = Number.Top + Number.Height + 100
            Scroll_Y.Left = scale_x.Left + scale_x.Width + 100
        Else
            Scroll_X.Visible = False
            Scroll_Y.Visible = False
        End If
    End Select
    Graph.Width = scale_x.Width
    Graph.Height = Number.Height
    Scroll_X.Left = Graph.Left
    Scroll_X.Width = Graph.Width
    Scroll_Y.Top = Graph.Top
    Scroll_Y.Height = Graph.Height
    Output
End Sub

Sub Out_Box(bx, by, bwidth, bheight As Long, bcolor As Long, Dat As String)
    Graph.CurrentX = bx
    Graph.CurrentY = by + 30
    Graph.Line Step(0, 0)-Step(bwidth, bheight - 60), bcolor, BF
    Graph.Line Step(0, 0)-Step(-bwidth, 0), QBColor(0), BF
    Graph.Line Step(0, 0)-Step(0, -bheight + 60), QBColor(15), BF
    Graph.Line Step(0, 0)-Step(bwidth, 0), QBColor(15), BF
    Graph.Line Step(0, 0)-Step(0, bheight - 60), QBColor(0), BF
    Graph.CurrentX = bx + Int((bwidth - (Len(Dat) * 100)) / 2)
```

```
    Graph.CurrentY = by + Int((bheight - 180) / 2)
    If Graph.CurrentX > bx Then
        Graph.Print Dat
    End If
End Sub

Sub Output()
    Dim pX, pY, pW As Long
    Dim Current, ScaleStep As Integer

    Randomize
    Graph.Cls
    Number.Cls
    scale_x.Cls
    Graph.ForeColor = 0
    pY = Graph.Top + Graph.Height
    i = Begin_X
    ScaleStep = Int(1100 / X_size)
    If ScaleStep = 0 Then ScaleStep = 1
    While ((i - Begin_X) * X_size <= scale_x.Width) And (i <= CInt(Max_Time))
        scale_x.CurrentX = (i - Begin_X) * X_size
        scale_x.CurrentY = scale_x.Height
        scale_x.Line Step(0, 0)-Step(0, -200), QBColor(0), BF
        temp = Str(i)
        temp = Right(temp, Len(temp) - 1)
        scale_x.CurrentX = scale_x.CurrentX + 20
        scale_x.CurrentY = 0
        scale_x.Print temp
        i = i + ScaleStep
    Wend
    i = Begin_Y
    While (i < Dat.job.Recordset.RecordCount) And ((i - Begin_Y) * Y_size < Number.Height)
        Number.CurrentX = 40
        Number.CurrentY = (i - Begin_Y) * Y_size + Int(Y_size / 2) - 120
        Number.Print i + 1
        Dat.job.Recordset.AbsolutePosition = i
        Graph.CurrentX = (Dat.job.Recordset("due_date") - Begin_X) * X_size
        Graph.CurrentY = (Dat.job.Recordset.AbsolutePosition - Begin_Y) * Y_size
        Graph.Line Step(0, 0)-Step(Graph.Width, Y_size), QBColor(8), BF
        i = i + 1
    Wend
    Dat.process.Recordset.MoveFirst
    Dat.job.Recordset.MoveFirst
    Current = Dat.process.Recordset("job_number")
    For i = 0 To Dat.datas.Recordset.RecordCount - 1
        Dat.datas.Recordset.AbsolutePosition = i
        Dat.process.Recordset.AbsolutePosition = i
        If Dat.datas.Recordset("rstart") < Dat.datas.Recordset("rend") Then
            If Current <> Dat.process.Recordset("job_number") Then
                Current = Dat.process.Recordset("job_number")
                Dat.job.Recordset.MoveNext
            End If
            pX = (Dat.datas.Recordset("rstart") - Begin_X) * X_size
            pY = (Dat.job.Recordset.AbsolutePosition - Begin_Y) * Y_size
            pW = Int((Dat.datas.Recordset("rend") - Dat.datas.Recordset("rstart")) * X_size)
```

```
        If Y_size > 0 Then
          If Dat.datas.Recordset("rend") <= Dat.job.Recordset("due_date") Then
            If Y_size > 720 Then
              Out_Box pX, pY + Int((Y_size - 720) / 2), pW - 16, 700,
QBColor(Dat.datas.Recordset("machine_number") + 1), Dat.datas.Recordset("Machine_Number") + 1
            Else
              Out_Box pX, pY, pW - 16, Y_size - 10, QBColor(Dat.datas.Recordset("machine_number") + 1),
Dat.datas.Recordset("machine_number") + 1
            End If
          Else
            If Y_size > 720 Then
              Out_LBox pX, pY + Int((Y_size - 720) / 2), pW - 16, 700,
QBColor(Dat.datas.Recordset("machine_number") + 1), Dat.datas.Recordset("Machine_Number") + 1
            Else
              Out_LBox pX, pY, pW - 16, Y_size - 10, QBColor(Dat.datas.Recordset("machine_number") +
1), Dat.datas.Recordset("machine_number") + 1
            End If
          End If
        End If
      Next i
      If Dat.Replace.Recordset.RecordCount > 0 Then
        Dat.Replace.Recordset.MoveLast
        For i = 0 To Dat.Replace.Recordset.RecordCount - 1
          Dat.Replace.Recordset.AbsolutePosition = i
          Dat.datas.Recordset.AbsolutePosition = Dat.Replace.Recordset("operation")
          Dat.process.Recordset.AbsolutePosition = Dat.Replace.Recordset("operation")
          tKey = "job_number = " + Str(Dat.process.Recordset("job_number"))
          Dat.job.Recordset.FindFirst tKey
          pX = (Dat.Replace.Recordset("rstart") - Begin_X) * X_size
          pY = (Dat.job.Recordset.AbsolutePosition - Begin_Y) * Y_size
          pW = Int((Dat.Replace.Recordset("rstop") - Dat.Replace.Recordset("rstart")) * X_size)
          If Y_size > 0 Then
            If Dat.Replace.Recordset("rstop") <= Dat.job.Recordset("due_date") Then
              If Y_size > 720 Then
                Out_Box pX, pY + Int((Y_size - 720) / 2), pW - 16, 700,
QBColor(Dat.datas.Recordset("machine_number") + 1), Dat.datas.Recordset("Machine_Number") + 1
              Else
                Out_Box pX, pY, pW - 16, Y_size - 10, QBColor(Dat.datas.Recordset("machine_number") + 1),
Dat.datas.Recordset("machine_number") + 1
              End If
            Else
              If Y_size > 720 Then
                Out_LBox pX, pY + Int((Y_size - 720) / 2), pW - 16, 700,
QBColor(Dat.datas.Recordset("machine_number") + 1), Dat.datas.Recordset("Machine_Number") + 1
              Else
                Out_LBox pX, pY, pW - 16, Y_size - 10, QBColor(Dat.datas.Recordset("machine_number") +
1), Dat.datas.Recordset("machine_number") + 1
              End If
            End If
          End If
        Next i
      End If
End Sub
```

```
Private Sub Form_Activate()
    Randomize
    If (RMax_Time > 0) Then
        Arrange_form
        If first_in Then
            first_in = False
            Zoom.ListIndex = 0
        End If
    Else
        temp = MsgBox("Error! Data not ready", vbOKOnly, "Error")
        JobChart.Enabled = False
        JobChart.Visible = False
        Unload JobChart
        Main.Enabled = True
        Main.Visible = True
    End If
End Sub

Private Sub Form_Resize()
    If Not (first_in) Then
        If RJobChart.WindowState <> 1 Then
            If RJobChart.Height < (2500 + Dat.job.Recordset.RecordCount * 300) Then
                RJobChart.Height = (2500 + Dat.job.Recordset.RecordCount * 300)
            End If
            If RJobChart.Width < 6500 Then
                RJobChart.Width = 6500
            End If
            Arrange_form
        End If
    End If
End Sub


Private Sub Form_Unload(Cancel As Integer)
    RJobChart.Enabled = False
    RJobChart.Visible = False
    Unload RJobChart
    Main.Enabled = True
    Main.Visible = True
End Sub


Private Sub Graph_MouseDown(Button As Integer, Shift As Integer, X As Single, Y As Single)
    Dim tY, tX As Double
    Dim aY As Integer
    Dim aX As Single
    Dim temp, temp1 As Long
    Dim found As Boolean
    Dim Message As String

    Graph.CurrentX = X
    Graph.CurrentY = Y
    If Button > 1 Then
        aY = Int(Graph.CurrentY / Y_size)
        If Y_size > 720 Then
```

```
            temp = aY * Y_size + Int((Y_size - 720) / 2)
            temp1 = (aY + 1) * Y_size - Int((Y_size - 720) / 2)
         Else
            temp = aY * Y_size
            temp1 = temp + Y_size
         End If
         If (Graph.CurrentY > temp) And (Graph.CurrentY < temp1) Then
            aY = aY + Begin_Y
            Dat.job.Recordset.AbsolutePosition = aY
            temp = Dat.job.Recordset("job_number")
            aX = Graph.CurrentX / X_size + Begin_X
            Dat.datas.Recordset.MoveFirst
            Dat.process.Recordset.MoveFirst
            found = False
            Do
               If (Dat.datas.Recordset("nstart") < aX) And (aX < Dat.datas.Recordset("nend")) And
(Dat.process.Recordset("job_number") = temp) Then
                  found = True
                  Exit Do
               Else
                  If (Dat.datas.Recordset.AbsolutePosition >= Dat.datas.Recordset.RecordCount - 1) Then
                     Exit Do
                  End If
               End If
               Dat.datas.Recordset.MoveNext
               Dat.process.Recordset.MoveNext
            Loop Until (found)
            If Not (found) Then
               Dat.Replace.Recordset.MoveFirst
               Do
                  If (Dat.Replace.Recordset("nstart") < aX) And (aX < Dat.Replace.Recordset("nstop")) Then
                     Dat.process.Recordset.AbsolutePosition = Dat.Replace.Recordset("operation")
                     If (Dat.process.Recordset("job_number") = temp) Then
                        found = True
                        Exit Do
                     End If
                  Else
                     If (Dat.Replace.Recordset.AbsolutePosition >= Dat.Replace.Recordset.RecordCount - 1) Then
                        Exit Do
                     End If
                  End If
                  Dat.Replace.Recordset.MoveNext
               Loop Until (found)
               If found Then
                  Dat.process.Recordset.AbsolutePosition = Dat.Replace.Recordset("operation")
                  temp2 = "Job_number = " + Str(Dat.process.Recordset("Job_number"))
                  Dat.job.Recordset.FindFirst temp2
                  m1 = "Job                    " & Dat.job.Recordset("job_name") & Chr(10) & Chr(13)
                  m2 = "Opertion               " & Dat.process.Recordset("process_name") & Chr(10) & Chr(13)
                  m3 = "Machine                " & Dat.process.Recordset("machine_name") & Chr(10) &
Chr(13)
                  m4 = "Start                  " & Format(Dat.Replace.Recordset("nstart"), "#,##0.00") &
Chr(10) & Chr(13)
                  m5 = "End                    " & Format(Dat.Replace.Recordset("nstop"), "#,##0.00") &
Chr(10) & Chr(13)
```

```
                m6 = "Processing Time        " & Format(Dat.Replace.Recordset("rstop") -
Dat.Replace.Recordset("rstart"), "#,##0.00") & Chr(10) & Chr(13)
                Message = m1 & m2 & m3 & m4 & m5 & m6
                temp = MsgBox(Message, vbOKOnly, "Data")
            End If
            found = False
        End If
        If found Then
            Dat.process.Recordset.AbsolutePosition = Dat.datas.Recordset.AbsolutePosition
            temp2 = "Job_number = " + Str(Dat.process.Recordset("Job_number"))
            Dat.job.Recordset.FindFirst temp2
            m1 = "Job                    " & Dat.job.Recordset("job_name") & Chr(10) & Chr(13)
            m2 = "Opertion               " & Dat.process.Recordset("process_name") & Chr(10) & Chr(13)
            m3 = "Machine                " & Dat.process.Recordset("machine_name") & Chr(10) & Chr(13)
            m4 = "Start                  " & Format(Dat.datas.Recordset("rstart"), "#,##0.00") & Chr(10) &
Chr(13)
            m5 = "End                    " & Format(Dat.datas.Recordset("rend"), "#,##0.00") & Chr(10) &
Chr(13)
            m6 = "Processing Time        " & Format(Dat.datas.Recordset("rend") -
Dat.datas.Recordset("rstart"), "#,##0.00") & Chr(10) & Chr(13)
            Message = m1 & m2 & m3 & m4 & m5 & m6
            temp = MsgBox(Message, vbOKOnly, "Data")
        End If
    End If
  Else
    tY = Int(Graph.CurrentY / Y_size)
    If Y_size > 720 Then
        temp = tY * Y_size + Int((Y_size - 720) / 2)
        temp1 = (tY + 1) * Y_size - Int((Y_size - 720) / 2)
    Else
        temp = tY * Y_size
        temp1 = temp + Y_size
    End If
    If (Graph.CurrentY > temp) And (Graph.CurrentY < temp + 500) Then
        tY = tY + Begin_Y
        Dat.job.Recordset.AbsolutePosition = tY
        tKey = "job_number = " + Str(Dat.job.Recordset("job_number"))
        Dat.process.Recordset.FindFirst tKey
        Dat.datas.Recordset.MoveLast
        Dat.datas.Recordset.AbsolutePosition = Dat.process.Recordset.AbsolutePosition
        tX = Graph.CurrentX / X_size + Begin_X
        found = False
        Do
            If (Dat.datas.Recordset("rstart") < tX) And (tX < Dat.datas.Recordset("rend")) Then
                found = True
                temp = Dat.process.Recordset("job_number")
                If Dat.process.Recordset.AbsolutePosition > 0 Then
                    Dat.process.Recordset.MovePrevious
                    If Dat.process.Recordset("job_number") = temp Then
                        Dat.datas.Recordset.MovePrevious
                        Least = Dat.datas.Recordset("rend")
                        Dat.datas.Recordset.MoveNext
                    Else
                        Least = 0
                    End If
```

```
                Dat.process.Recordset.MoveNext
            Else
                Least = 0
            End If
            Graph.MousePointer = 2
            Oper_Point = Dat.datas.Recordset.AbsolutePosition
            pX = (Dat.datas.Recordset("rstart") - Begin_X) * X_size
            pY = (Dat.job.Recordset.AbsolutePosition - Begin_Y) * Y_size
            pW = Dat.process.Recordset("processing_time") * X_size
            Obj.Left = Graph.Left + pX + 30
            Old_Y = Obj.Top
            Obj.Top = Graph.Top + pY + Int((Y_size - 720) / 2) + 25
            Obj.Width = pW - 16
            Obj.Height = 720
            Obj.Caption = Dat.datas.Recordset("process_id")
            Obj.Visible = True
            Exit Do
        Else
            If (Dat.datas.Recordset.AbsolutePosition >= Dat.datas.Recordset.RecordCount - 1) Or
(Dat.process.Recordset("job_number") <> Dat.job.Recordset("job_number")) Then
                Exit Do
            End If
        End If
        Dat.process.Recordset.MoveNext
        Dat.datas.Recordset.MoveNext
    Loop Until (found)
  End If
 End If
End Sub

Private Sub Graph_MouseMove(Button As Integer, Shift As Integer, X As Single, Y As Single)
 If Obj.Visible Then
  temp = Int(X / X_size) + Begin_X
  If temp < Least Then
   temp = Least
  ElseIf temp < Begin_X Then
   Scroll_X.Value = Scroll_X.Value - Int(Begin_X - temp)
  End If
  If temp > RMax_Time Then
   temp = RMax_Time
  ElseIf temp - Begin_X >= Int((Graph.Width - 70) / X_size) Then
   If Scroll_X.Value < Scroll_X.Max Then
    Scroll_X.Value = Scroll_X.Value + temp - Begin_X - Int((Graph.Width - 70) / X_size)
   End If
  End If
  Obj.Left = Graph.Left + 30 + (temp - Begin_X) * X_size
 End If
End Sub

Private Sub Graph_MouseUp(Button As Integer, Shift As Integer, X As Single, Y As Single)
 Dim pX As Double
 Dim tX As Integer

 Dat.datas.Recordset.AbsolutePosition = Oper_Point
 tX = Int((Obj.Left - Graph.Left) / X_size)
```

```
    If Dat.datas.Recordset("nstart") <> tX Then
        Beep
        RChange_Prepare Oper_Point, tX
        RReArrange
        Gen_RPerformance
        RescheduleTable.Fill_Table
        RTable.Fill_Table
        RMcTable.Fill_Table
    End If
    Graph.MousePointer = 1
    Obj.Visible = False
    Output
End Sub

Private Sub Number_MouseDown(Button As Integer, Shift As Integer, X As Single, Y As Single)
    Dim aY As Integer
    Dim aX As Single
    Dim Message, tKey As String

    Number.CurrentX = X
    Number.CurrentY = Y
    If Button > 1 Then
        aY = Int(Number.CurrentY / Y_size)
        temp = aY * Y_size
        temp1 = temp + Y_size
        If (Number.CurrentY > temp) And (Number.CurrentY < temp1) Then
            aY = aY + Begin_Y
            Dat.job.Recordset.AbsolutePosition = aY
            m1 = "Job                          " & Dat.job.Recordset("job_name") & Chr(10) & Chr(13)
            m2 = "Number of Operations         " & Format(Dat.job.Recordset("process"), "#,##0") & Chr(10) &
Chr(13)
            m3 = "Due Date                     " & Format(Dat.job.Recordset("due_date"), "#,##0.00") & Chr(10) &
Chr(13)
            Message = m1 & m2 & m3
            temp = MsgBox(Message, vbOKOnly, "Data")
        End If
    End If
End Sub

Private Sub Quit_Click()
    RJobChart.Enabled = False
    RJobChart.Visible = False
    Unload RJobChart
End Sub
Private Sub Scroll_X_Change()
    Begin_X = Scroll_X.Value
    Output
End Sub
Private Sub Scroll_Y_Change()
    Begin_Y = Scroll_Y.Value
    Output
End Sub
Private Sub Zoom_Click()
    Arrange_form
End Sub
```

```
VERSION 4.00
Begin VB.Form RMcTable
   Caption         =  "Rescheduling Machine Utilization"
   ClientHeight    =  5205
   ClientLeft      =  1155
   ClientTop       =  1965
   ClientWidth     =  7470
   BeginProperty Font
      name            =  "MS Sans Serif"
      charset         =  222
      weight          =  700
      size            =  8.25
      underline       =  0   'False
      italic          =  0   'False
      strikethrough   =  0   'False
   EndProperty
   Height          =  5610
   Left            =  1095
   LinkTopic       =  "Form1"
   ScaleHeight     =  5205
   ScaleWidth      =  7470
   Top             =  1620
   Width           =  7590
   Begin VB.CommandButton Ok
      Caption         =  "&Close"
      Height          =  405
      Left            =  3360
      TabIndex        =  0
      Top             =  4800
      Width           =  1335
   End
   Begin VB.Label Border
      BorderStyle     =  1  'Fixed Single
      Height          =  3255
      Left            =  120
      TabIndex        =  5
      Top             =  480
      Width           =  7215
   End
   Begin MSGrid.Grid Data
      Height          =  1935
      Left            =  240
      TabIndex        =  4
      Top             =  600
      Width           =  5295
      _Version        =  65536
      _ExtentX        =  9340
      _ExtentY        =  3413
      _StockProps     =  77
      BackColor       =  16777215
      BorderStyle     =  0
      Rows            =  1
      Cols            =  3
      FixedRows       =  0
      FixedCols       =  0
```

```
    ScrollBars      =  2
  End
  Begin VB.Label Label3
    Alignment       =  2  'Center
    BackColor       =  &H00808080&
    BorderStyle     =  1  'Fixed Single
    Caption         =  "Utilization"
    Height          =  255
    Left            =  2640
    TabIndex        =  3
    Top             =  0
    Width           =  1335
  End
  Begin VB.Label Label2
    Alignment       =  2  'Center
    BackColor       =  &H00808080&
    BorderStyle     =  1  'Fixed Single
    Caption         =  "Machine Name"
    Height          =  255
    Left            =  840
    TabIndex        =  2
    Top             =  0
    Width           =  1695
  End
  Begin VB.Label Label1
    Alignment       =  2  'Center
    BackColor       =  &H00808080&
    BorderStyle     =  1  'Fixed Single
    Caption         =  "No."
    Height          =  255
    Left            =  120
    TabIndex        =  1
    Top             =  0
    Width           =  615
  End
End
Attribute VB_Name = "RMcTable"
Attribute VB_Creatable = False
Attribute VB_Exposed = False

Sub Arrange_form()
  Border.Left = 90
  Border.Top = 300
  Border.Width = RMcTable.Width - 320
  Border.Height = RMcTable.Height - 1200
  Data.Left = Border.Left + 40
  Data.Top = Border.Top + 40
  Data.Width = Border.Width - 80
  Data.Height = Border.Height - 80
  Ok.Left = Int((RMcTable.Width - Ok.Width) / 2)
  Ok.Top = RMcTable.Height - 820
  If Data.Height > (Data.RowHeight(0) + 15) * Data.Rows Then
    Label1.Top = 10
    Label1.Width = 600
    Label1.Left = Border.Left
```

```
        Label2.Top = Label1.Top
        Label2.Width = Int((Border.Width - Label1.Width) * 0.5)
        Label2.Left = Label1.Left + Label1.Width + 10
        temp = Border.Width - Label1.Width - Label2.Width - 20
        Label3.Top = Label1.Top
        Label3.Width = temp
        Label3.Left = Label2.Left + Label2.Width + 10
        Data.ColWidth(0) = Label1.Width - 40
        Data.ColWidth(1) = Label2.Width
        Data.ColWidth(2) = Label3.Width - 50
    Else
        Label1.Top = 10
        Label1.Width = 600
        Label1.Left = Border.Left
        Label2.Top = Label1.Top
        Label2.Width = Int((Border.Width - Label1.Width - 300) * 0.5)
        Label2.Left = Label1.Left + Label1.Width + 10
        temp = Border.Width - Label1.Width - Label2.Width - 320
        Label3.Top = Label1.Top
        Label3.Width = temp
        Label3.Left = Label2.Left + Label2.Width + 10
        Data.ColWidth(0) = Label1.Width - 40
        Data.ColWidth(1) = Label2.Width
        Data.ColWidth(2) = Label3.Width - 50
    End If

End Sub
Sub Fill_Table()
    Dim util As Double
    Data.ColAlignment(0) = 1
    Data.ColAlignment(1) = 0
    Data.ColAlignment(2) = 1
    Data.Rows = Dat.machine.Recordset.RecordCount + 1
    Dat.machine.Recordset.MoveLast
    util = 0
    For i = 0 To Dat.machine.Recordset.RecordCount - 1
        Dat.machine.Recordset.AbsolutePosition = i
        Data.Row = i
        Data.Col = 0
        Data.Text = i + 1
        Data.Col = 1
        Data.Text = Dat.machine.Recordset("machine_name")
        Data.Col = 2
        Data.Text = Format(Dat.machine.Recordset("rutilization"), "##0.00")
        util = util + Dat.machine.Recordset("rutilization")
    Next i
    Data.Row = Dat.machine.Recordset.RecordCount
    Data.Col = 0
    Data.Text = ""
    Data.Col = 1
    Data.Text = "Average"
    Data.Col = 2
    Data.Text = Format(util / Dat.machine.Recordset.RecordCount, "##0.00")
End Sub
```

```
Private Sub Form_Activate()
    Arrange_form
End Sub

Private Sub Form_Resize()
    If RMcTable.WindowState <> 1 Then
        If RMcTable.Width < 5000 Then RMcTable.Width = 5000
        If RMcTable.Height < 2500 Then RMcTable.Height = 2500
        Arrange_form
    End If
End Sub


Private Sub Form_Unload(Cancel As Integer)
    RMcTable.Enabled = False
    RMcTable.Visible = False
    Unload RMcTable
    Main.Enabled = True
    Main.Visible = True
    Main.SetFocus
End Sub


Private Sub Ok_Click()
    RMcTable.Enabled = False
    RMcTable.Visible = False
    Unload RMcTable
    Main.Enabled = True
    Main.Visible = True
    Main.SetFocus
End Sub
```

```
VERSION 4.00
Begin VB.Form RTable
   Caption         =  "Rescheduling Job Performance"
   ClientHeight    =  5625
   ClientLeft      =  720
   ClientTop       =  2040
   ClientWidth     =  7890
   BeginProperty Font
      name         =  "MS Sans Serif"
      charset      =  222
      weight       =  700
      size         =  8.25
      underline    =  0   'False
      italic       =  0   'False
      strikethrough  =  0   'False
   EndProperty
   Height          =  6030
   Left            =  660
   LinkTopic       =  "Form1"
   ScaleHeight     =  5625
   ScaleWidth      =  7890
   Top             =  1695
   Width           =  8010
   Begin VB.CommandButton Ok
      Caption      =  "&Close"
      Height       =  405
      Left         =  3600
      TabIndex     =  0
      Top          =  5040
      Width        =  1335
   End
   Begin VB.Label Label1
      Alignment    =  2  'Center
      BackColor    =  &H00808080&
      BorderStyle  =  1  'Fixed Single
      Caption      =  "No."
      Height       =  255
      Left         =  360
      TabIndex     =  6
      Top          =  240
      Width        =  615
   End
   Begin VB.Label Label2
      Alignment    =  2  'Center
      BackColor    =  &H00808080&
      BorderStyle  =  1  'Fixed Single
      Caption      =  "Job Name"
      Height       =  255
      Left         =  1080
      TabIndex     =  5
      Top          =  240
      Width        =  1695
   End
   Begin VB.Label Label3
      Alignment    =  2  'Center
```

```
    BackColor       =   &H00808080&
    BorderStyle     =   1  'Fixed Single
    Caption         =   "FlowTime"
    Height          =   255
    Left            =   2880
    TabIndex        =   4
    Top             =   240
    Width           =   1335
  End
  Begin VB.Label Label4
    Alignment       =   2  'Center
    BackColor       =   &H00808080&
    BorderStyle     =   1  'Fixed Single
    Caption         =   "Lateness"
    Height          =   255
    Left            =   4320
    TabIndex        =   3
    Top             =   240
    Width           =   1335
  End
  Begin VB.Label Label5
    Alignment       =   2  'Center
    BackColor       =   &H00808080&
    BorderStyle     =   1  'Fixed Single
    Caption         =   "Tardiness"
    Height          =   255
    Left            =   5760
    TabIndex        =   2
    Top             =   240
    Width           =   1335
  End
  Begin MSGrid.Grid Data
    Height          =   1935
    Left            =   480
    TabIndex        =   1
    Top             =   840
    Width           =   5295
    _Version        =   65536
    _ExtentX        =   9340
    _ExtentY        =   3413
    _StockProps     =   77
    BackColor       =   16777215
    BorderStyle     =   0
    Rows            =   1
    Cols            =   5
    FixedRows       =   0
    FixedCols       =   0
    ScrollBars      =   2
  End
  Begin VB.Label Border
    BorderStyle     =   1  'Fixed Single
    Height          =   3255
    Left            =   360
    TabIndex        =   7
    Top             =   720
```

```
    Width          =  7215
  End
End
Attribute VB_Name = "RTable"
Attribute VB_Creatable = False
Attribute VB_Exposed = False
Sub Arrange_form()
   Border.Left = 90
   Border.Top = 300
   Border.Width = RTable.Width - 320
   Border.Height = RTable.Height - 1200
   Data.Left = Border.Left + 40
   Data.Top = Border.Top + 40
   Data.Width = Border.Width - 80
   Data.Height = Border.Height - 80
   Ok.Left = Int((RTable.Width - Ok.Width) / 2)
   Ok.Top = RTable.Height - 820
   If Data.Height > (Data.RowHeight(0) + 15) * Data.Rows Then
      Label1.Top = 10
      Label1.Width = 600
      Label1.Left = Border.Left
      Label2.Top = Label1.Top
      Label2.Width = Int((Border.Width - Label1.Width) * 0.4)
      Label2.Left = Label1.Left + Label1.Width + 10
      temp = Border.Width - Label1.Width - Label2.Width - 20
      Label3.Top = Label1.Top
      Label3.Width = Int(temp / 3)
      Label3.Left = Label2.Left + Label2.Width + 10
      temp = temp - Label3.Width
      Label4.Top = Label1.Top
      Label4.Width = Int(temp / 2)
      Label4.Left = Label3.Left + Label3.Width + 10
      Label5.Top = Label1.Top
      Label5.Width = temp - Label4.Width
      Label5.Left = Label4.Left + Label4.Width + 10
      Data.ColWidth(0) = Label1.Width - 40
      Data.ColWidth(1) = Label2.Width
      Data.ColWidth(2) = Label3.Width - 20
      Data.ColWidth(3) = Label4.Width
      Data.ColWidth(4) = Label5.Width - 60
   Else
      Label1.Top = 10
      Label1.Width = 600
      Label1.Left = Border.Left
      Label2.Top = Label1.Top
      Label2.Width = Int((Border.Width - Label1.Width - 300) * 0.4)
      Label2.Left = Label1.Left + Label1.Width + 10
      temp = Border.Width - Label1.Width - Label2.Width - 320
      Label3.Top = Label1.Top
      Label3.Width = Int(temp / 3)
      Label3.Left = Label2.Left + Label2.Width + 10
      temp = temp - Label3.Width
      Label4.Top = Label1.Top
      Label4.Width = Int(temp / 2)
      Label4.Left = Label3.Left + Label3.Width + 10
```

```
        Label5.Top = Label1.Top
        Label5.Width = temp - Label4.Width
        Label5.Left = Label4.Left + Label4.Width + 10
        Data.ColWidth(0) = Label1.Width - 40
        Data.ColWidth(1) = Label2.Width
        Data.ColWidth(2) = Label3.Width - 20
        Data.ColWidth(3) = Label4.Width
        Data.ColWidth(4) = Label5.Width - 60
    End If

End Sub
Sub Fill_Table()
    Dim T_FlowTime, T_Lateness, T_Tardiness As Long
    Dim N_Tardiness As Integer

    Data.ColAlignment(0) = 1
    Data.ColAlignment(1) = 0
    Data.ColAlignment(2) = 1
    Data.ColAlignment(3) = 1
    Data.ColAlignment(4) = 1
    Data.Rows = Dat.job.Recordset.RecordCount + 2
    Dat.performance.Recordset.MoveLast
    Dat.job.Recordset.MoveLast
    T_FlowTime = 0
    T_Lateness = 0
    T_Tardiness = 0
    N_Tardiness = 0
    For i = 0 To Dat.job.Recordset.RecordCount - 1
        Dat.performance.Recordset.AbsolutePosition = i
        Dat.job.Recordset.AbsolutePosition = i
        Data.Row = i
        Data.Col = 0
        Data.Text = i + 1
        Data.Col = 1
        Data.Text = Dat.job.Recordset("job_name")
        Data.Col = 2
        Data.Text = Format(Dat.performance.Recordset("rflowtime"), "##0.00")
        Data.Col = 3
        Data.Text = Format(Dat.performance.Recordset("rlateness"), "##0.00")
        Data.Col = 4
        Data.Text = Format(Dat.performance.Recordset("rtardiness"), "##0.00")
        T_FlowTime = T_FlowTime + Dat.performance.Recordset("rflowtime")
        T_Lateness = T_Lateness + Dat.performance.Recordset("rlateness")
        T_Tardiness = T_Tardiness + Dat.performance.Recordset("rtardiness")
        If Dat.performance.Recordset("rtardiness") > 0 Then
            N_Tardiness = N_Tardiness + 1
        End If
    Next i
    Data.Row = Dat.job.Recordset.RecordCount
    Data.Col = 0
    Data.Text = ""
    Data.Col = 1
    Data.Text = "Average"
    Data.Col = 2
    Data.Text = Format(T_FlowTime / Dat.job.Recordset.RecordCount, "##0.00")
```

```
    Data.Col = 3
    Data.Text = Format(T_Lateness / Dat.job.Recordset.RecordCount, "##0.00")
    Data.Col = 4
    Data.Text = Format(T_Tardiness / Dat.job.Recordset.RecordCount, "##0.00")
    Data.Row = Dat.job.Recordset.RecordCount + 1
    Data.Col = 0
    Data.Text = ""
    Data.Col = 1
    Data.Text = "Number of Tardiness Job"
    Data.Col = 2
    Data.Text = ""
    Data.Col = 3
    Data.Text = ""
    Data.Col = 4
    Data.Text = Format(N_Tardiness, "##0.00")
End Sub

Private Sub Form_Activate()
    Arrange_form
End Sub

Private Sub Form_Resize()
    If RTable.WindowState <> 1 Then
        If RTable.Width < 5500 Then RTable.Width = 5500
        If RTable.Height < 2500 Then RTable.Height = 2500
        Arrange_form
    End If
End Sub


Private Sub Form_Unload(Cancel As Integer)
    RTable.Enabled = False
    RTable.Visible = False
    Unload RTable
    Main.Enabled = True
    Main.Visible = True
    Main.SetFocus
End Sub


Private Sub Ok_Click()
    RTable.Enabled = False
    RTable.Visible = False
    Unload RTable
    Main.Enabled = True
    Main.Visible = True
    Main.SetFocus
End Sub
```

```
VERSION 4.00
Begin VB.Form RTimeUtilization
   Caption         =  "Rescheduling Utilization Graph"
   ClientHeight    =  4875
   ClientLeft      =  1560
   ClientTop       =  1935
   ClientWidth     =  6600
   Height          =  5280
   Left            =  1500
   LinkTopic       =  "Form1"
   ScaleHeight     =  4875
   ScaleWidth      =  6600
   Top             =  1590
   Width           =  6720
   Begin VB.PictureBox Scale_X
      AutoRedraw      =  -1  'True
      Height          =  255
      Left            =  600
      ScaleHeight     =  195
      ScaleWidth      =  5835
      TabIndex        =  5
      TabStop         =  0   'False
      Top             =  0
      Width           =  5895
   End
   Begin VB.PictureBox Number
      AutoRedraw      =  -1  'True
      Height          =  3855
      Left            =  120
      ScaleHeight     =  3795
      ScaleWidth      =  315
      TabIndex        =  4
      TabStop         =  0   'False
      Top             =  360
      Width           =  375
   End
   Begin VB.PictureBox Graph
      AutoRedraw      =  -1  'True
      Height          =  3870
      Left            =  600
      ScaleHeight     =  3810
      ScaleWidth      =  5865
      TabIndex        =  3
      TabStop         =  0   'False
      Top             =  360
      Width           =  5925
   End
   Begin VB.TextBox MoNum
      Alignment       =  1  'Right Justify
      BeginProperty Font
         name            =  "MS Sans Serif"
         charset         =  222
         weight          =  700
         size            =  8.25
         underline       =  0   'False
```

```
    italic          =  0   'False
    strikethrough   =  0   'False
  EndProperty
  Height          =  315
  Left            =  240
  TabIndex        =  2
  Top             =  4530
  Width           =  1335
End
Begin VB.CommandButton CalData
  Caption         =  "Calculate"
  BeginProperty Font
    name          =  "MS Sans Serif"
    charset       =  222
    weight        =  700
    size          =  8.25
    underline     =  0   'False
    italic        =  0   'False
    strikethrough =  0   'False
  EndProperty
  Height          =  255
  Left            =  1560
  TabIndex        =  1
  Top             =  4560
  Width           =  975
End
Begin VB.CommandButton Quit
  Caption         =  "&Close"
  BeginProperty Font
    name          =  "MS Sans Serif"
    charset       =  222
    weight        =  700
    size          =  8.25
    underline     =  0   'False
    italic        =  0   'False
    strikethrough =  0   'False
  EndProperty
  Height          =  375
  Left            =  3120
  TabIndex        =  0
  Top             =  4440
  Width           =  1215
End
Begin VB.Label Label1
  AutoSize        =  -1  'True
  Caption         =  "Machine Index"
  BeginProperty Font
    name          =  "MS Sans Serif"
    charset       =  222
    weight        =  700
    size          =  8.25
    underline     =  0   'False
    italic        =  0   'False
    strikethrough =  0   'False
  EndProperty
```

```
    Height          =  195
    Left            =  240
    TabIndex        =  6
    Top             =  4320
    Width           =  1245
  End
End
Attribute VB_Name = "RTimeUtilization"
Attribute VB_Creatable = False
Attribute VB_Exposed = False
Dim X_size, Y_size As Long
Dim McIndex As Integer
Dim first_in As Boolean
Sub Arrange_form()
  scale_x.Height = 250
  scale_x.Top = 100
  Number.Left = 100
  Number.Width = 400
  Label1.Left = Number.Left
  Label1.Top = RTimeUtilization.Height - 1000
  McNum.Left = Number.Left
  McNum.Top = RTimeUtilization.Height - 800
  CalData.Left = McNum.Left + McNum.Width
  CalData.Top = McNum.Top + 20
  CalData.Height = McNum.Height - 20
  scale_x.Left = Number.Left + Number.Width + 50
  Number.Top = scale_x.Top + scale_x.Height + 50
  Graph.Left = scale_x.Left
  Graph.Top = Number.Top
  Quit.Left = Int((RTimeUtilization.Width - Quit.Width) / 2)
  Quit.Top = RTimeUtilization.Height - 900
  scale_x.Width = RTimeUtilization.Width - Graph.Left - 200
  Number.Height = Quit.Top - Graph.Top - 200
  Graph.Width = scale_x.Width
  Graph.Height = Number.Height
  Output
End Sub
Sub Output()
  Dim found, Quit, select_First, select_Replace As Boolean
  Dim First, min As Integer
  Dim fCollect, fValue, cx, minValue, tStart, tStop As Double
  Dim pW, pY As Long
  Dim tKey, tKey2 As String

  Randomize
  Graph.Cls
  Number.Cls
  scale_x.Cls
  Graph.ForeColor = 0
  i = 0
  X_size = Int((scale_x.Width - 70) / RMax_Time)
  Y_size = Int((Number.Height - 60) / 2)
  ScaleStep = Int(1100 / X_size)
  If ScaleStep = 0 Then ScaleStep = 1
  While i <= CInt(RMax_Time)
```

```
    scale_x.CurrentX = i * X_size
    scale_x.CurrentY = scale_x.Height
    scale_x.Line Step(0, 0)-Step(0, -200), QBColor(0), BF
    temp = Str(i)
    temp = Right(temp, Len(temp) - 1)
    scale_x.CurrentX = scale_x.CurrentX + 20
    scale_x.CurrentY = 0
    scale_x.Print temp
    i = i + ScaleStep
  Wend
  For i = 0 To 1
    Number.CurrentX = 20
    Number.CurrentY = i * Y_size + Int(Y_size / 2) - 120
    Number.Print "U(t)"
    Graph.CurrentX = 0
    Graph.CurrentY = i * Y_size + 150
    Graph.Line Step(0, 0)-Step(Graph.Width, 0), QBColor(12)
    Graph.CurrentX = 0
    Graph.CurrentY = (i + 1) * Y_size - 150
    Graph.Line Step(0, 0)-Step(Graph.Width, 0), QBColor(12)
  Next i
  Number.CurrentX = 20
  Number.CurrentY = Y_size + Int(Y_size / 2) - 130
  Number.Line Step(0, 0)-Step(130, -15), QBColor(0), BF
  Quit = False
  fValue = 0
  fCollect = 0
  cx = 0
  select_First = False
  tKey = "machine_number = " & McIndex
  tKey2 = "machine_num = " & McIndex
  Dat.datas.Recordset.FindFirst tKey
  First = Dat.datas.Recordset.AbsolutePosition
  While Not (Quit)
    Dat.datas.Recordset.FindFirst tKey
    min = Dat.datas.Recordset.AbsolutePosition
    select_Replace = False
    If select_First Then
      minValue = 32700
    Else
      tStart = Dat.datas.Recordset("rstart")
      tStop = Dat.datas.Recordset("rend")
      minValue = Dat.datas.Recordset("rstart")
    End If
    Dat.datas.Recordset.FindNext tKey
    While Not (Dat.datas.Recordset.NoMatch)
      If (Dat.datas.Recordset("rstart") >= cx) And (Dat.datas.Recordset("rstart") < minValue) Then
        tStart = Dat.datas.Recordset("rstart")
        tStop = Dat.datas.Recordset("rend")
        min = Dat.datas.Recordset.AbsolutePosition
        minValue = Dat.datas.Recordset("rstart")
      End If
      Dat.datas.Recordset.FindNext tKey
    Wend
    If Dat.Replace.Recordset.RecordCount > 0 Then
```

```
        Dat.Replace.Recordset.FindFirst tKey2
        If Not (Dat.Replace.Recordset.NoMatch) And (Dat.Replace.Recordset("rstart") >= cx) And
(Dat.Replace.Recordset("rstart") < minValue) Then
            tStart = Dat.Replace.Recordset("rstart")
            tStop = Dat.Replace.Recordset("rstop")
            minValue = Dat.Replace.Recordset("rstart")
            select_Replace = True
        End If
        Dat.Replace.Recordset.FindNext tKey2
        While Not (Dat.Replace.Recordset.NoMatch)
            If (Dat.Replace.Recordset("rstart") >= cx) And (Dat.Replace.Recordset("rstart") < minValue) Then
                tStart = Dat.Replace.Recordset("rstart")
                tStop = Dat.Replace.Recordset("rstop")
                minValue = Dat.Replace.Recordset("rstart")
                select_Replace = True
            End If
            Dat.Replace.Recordset.FindNext tKey2
        Wend
    End If
    If (min = First) And (select_First) And Not (select_Replace) Then
        Quit = True
    Else
        If (min = First) And Not (select_Replace) Then select_First = True
        Graph.CurrentX = cx * X_size
        Graph.CurrentY = 150
        If Int(tStart - cx) > 0 Then
            pW = CInt((tStart - cx) * X_size)
            Graph.Line Step(0, 0)-Step(0, Y_size - 300), QBColor(0)   '
            Graph.Line Step(0, 0)-Step(pW, 0), QBColor(0)
            Graph.Line Step(0, 0)-Step(0, -(Y_size - 300)), QBColor(0)
        End If
        pW = CInt((tStop - tStart) * X_size)
        Graph.Line Step(0, 0)-Step(pW, 0), QBColor(0)
        Graph.CurrentX = cx * X_size
        If cx = 0 Then
            If tStart > 0 Then
                Graph.CurrentY = 2 * Y_size - 150
                pW = CInt((tStart - cx) * X_size)
                Graph.Line Step(0, 0)-Step(pW, 0), QBColor(9)
            Else
                Graph.CurrentY = Y_size + 150
                fValue = 1
            End If
        Else
            Graph.CurrentY = 2 * Y_size - Int(fValue * (Y_size - 300)) - 150
            If Int(tStart - cx) > 0 Then
                pW = CInt((tStart - cx) * X_size)
                pY = CInt((fValue - (fCollect / tStart)) * (Y_size - 300))
                Graph.Line Step(0, 0)-Step(pW, pY), QBColor(9)
                fValue = fCollect / tStart
            End If
        End If
        fCollect = fCollect + tStop - tStart
        pW = CInt((tStop - tStart) * X_size)
        pY = CInt((fCollect / tStop - fValue) * (Y_size - 300))
```

```
            Graph.Line Step(0, 0)-Step(pW, -pY), QBColor(9)
            fValue = fCollect / tStop
            cx = tStop
        End If
    Wend
End Sub

Private Sub CalData_Click()
    If McNum.Text = "" Then
        McIndex = 0
    Else
        McIndex = Val(McNum.Text) - 1
        If McIndex < 0 Then McIndex = 0
        If McIndex >= Dat.machine.Recordset.RecordCount Then
            McIndex = Dat.machine.Recordset.RecordCount - 1
        End If
        McNum.Text = Str(McIndex + 1)
    End If
    Output
End Sub


Private Sub Form_Activate()
    Randomise
    If first_in Then
        first_in = False
        McNum.Text = 1
    End If
    Arrange_form
End Sub

Private Sub Form_Load()
    first_in = True
End Sub

Private Sub Form_Resize()
    If WindowState <> 1 Then
        If TimeUtilization.Height < (2500 + Dat.machine.Recordset.RecordCount * 300) Then
            TimeUtilization.Height = (2500 + Dat.machine.Recordset.RecordCount * 300)
        End If
        If TimeUtilization.Width < 6500 Then
            TimeUtilization.Width = 6500
        End If
        Arrange_form
    End If
End Sub


Private Sub Form_Unload(Cancel As Integer)
    TimeUtilization.Enabled = False
    TimeUtilization.Visible = False
    Unload TimeUtilization
    Main.Enabled = True
    Main.Visible = True
    Main.SetFocus
```

```
End Sub


Private Sub MaNum_KeyPress(KeyAscii As Integer)
   If KeyAscii = 13 Then
      CallData.SetFocus
   End If
End Sub


Private Sub Quit_Click()
   RTimeUtilization.Enabled = False
   RTimeUtilization.Visible = False
   Unload RTimeUtilization
   Main.Enabled = True
   Main.Visible = True
   Main.SetFocus
End Sub
```

```
VERSION 4.00
Begin VB.Form ScheduleTable
   Caption         =  "Scheduling Job Table"
   ClientHeight    =  4950
   ClientLeft      =  855
   ClientTop       =  2115
   ClientWidth     =  8145
   BeginProperty Font
      name         =  "MS Sans Serif"
      charset      =  222
      weight       =  700
      size         =  8.25
      underline    =  0   'False
      italic       =  0   'False
      strikethrough =  0   'False
   EndProperty
   Height          =  5355
   Left            =  795
   LinkTopic       =  "Form1"
   ScaleHeight     =  4950
   ScaleWidth      =  8145
   Top             =  1770
   Width           =  8265
   Begin VB.CommandButton Quit
      Caption      =  "&Close"
      Height       =  375
      Left         =  2640
      TabIndex     =  0
      Top          =  3960
      Width        =  1215
   End
   Begin VB.Label Label7
      Alignment    =  2  'Center
      BackColor    =  &H00808080&
      BorderStyle  =  1  'Fixed Single
      Caption      =  "ProcessingTime"
      Height       =  255
      Left         =  6600
      TabIndex     =  9
      Top          =  0
      Width        =  975
   End
   Begin MSGrid.Grid Table
      Height       =  1335
      Left         =  120
      TabIndex     =  7
      Top          =  480
      Width        =  4815
      _Version     =  65536
      _ExtentX     =  8493
      _ExtentY     =  2355
      _StockProps  =  77
      BackColor    =  16777215
      BorderStyle  =  0
      Rows         =  1
```

```
    Cols            =  7
    FixedRows       =  0
    FixedCols       =  0
    ScrollBars      =  2
  End
  Begin VB.Label Label4
    Alignment       =  2  'Center
    BackColor       =  &H00808080&
    BorderStyle     =  1  'Fixed Single
    Caption         =  "Starting Time"
    Height          =  255
    Left            =  4080
    TabIndex        =  6
    Top             =  0
    Width           =  1470
  End
  Begin VB.Label Label5
    Alignment       =  2  'Center
    BackColor       =  &H00808080&
    BorderStyle     =  1  'Fixed Single
    Caption         =  "Ending time"
    Height          =  255
    Left            =  5520
    TabIndex        =  5
    Top             =  0
    Width           =  1095
  End
  Begin VB.Label Label1
    Alignment       =  2  'Center
    BackColor       =  &H00808080&
    BorderStyle     =  1  'Fixed Single
    Caption         =  "Job Name"
    Height          =  255
    Left            =  360
    TabIndex        =  4
    Top             =  0
    Width           =  975
  End
  Begin VB.Label Label3
    Alignment       =  2  'Center
    BackColor       =  &H00808080&
    BorderStyle     =  1  'Fixed Single
    Caption         =  "Machine Name"
    Height          =  255
    Left            =  2760
    TabIndex        =  3
    Top             =  0
    Width           =  1335
  End
  Begin VB.Label Label2
    Alignment       =  2  'Center
    BackColor       =  &H00808080&
    BorderStyle     =  1  'Fixed Single
    Caption         =  "Operation Name"
    Height          =  255
```

```
    Left            =   1320
    TabIndex        =   2
    Top             =   0
    Width           =   1455
  End
  Begin VB.Label Label6
    AutoSize        =   -1  'True
    BackColor       =   &H00808080&
    BorderStyle     =   1  'Fixed Single
    Caption         =   "No."
    Height          =   255
    Left            =   0
    TabIndex        =   1
    Top             =   0
    Width           =   360
  End
  Begin VB.Label Border
    BorderStyle     =   1  'Fixed Single
    Height          =   2655
    Left            =   0
    TabIndex        =   8
    Top             =   360
    Width           =   6135
  End
End
Attribute VB_Name = "ScheduleTable"
Attribute VB_Creatable = False
Attribute VB_Exposed = False

Sub Arrange_form()
    Border.Left = 90
    Border.Top = 300
    Border.Width = ScheduleTable.Width - 320
    Border.Height = ScheduleTable.Height - 1200
    Table.Left = Border.Left + 40
    Table.Top = Border.Top + 40
    Table.Width = Border.Width - 80
    Table.Height = Border.Height - 80
    Quit.Left = Int((ScheduleTable.Width - Quit.Width) / 2)
    Quit.Top = ScheduleTable.Height - 820
    If Table.Height > (Table.RowHeight(0) + 15) * Table.Rows Then
      Label6.Top = 10
      Label6.Width = 500
      Label6.Left = 100
      Label7.Top = Label6.Top
      Label7.Width = 1400
      Label7.Left = ScheduleTable.Width - Label7.Width - 220
      Label5.Top = Label6.Top
      Label5.Width = 1400
      Label5.Left = Label7.Left - Label5.Width - 20
      Label4.Top = Label6.Top
      Label4.Width = 1400
      Label4.Left = Label5.Left - Label4.Width - 20
      temp = Int((Label4.Left - 1000) / 3)
      Label3.Top = Label6.Top
```

```
        Label3.Width = temp
        Label3.Left = Label4.Left - temp - 20
        temp = Int((Label3.Left - 1000) / 2)
        Label2.Top = Label6.Top
        Label2.Width = temp
        Label2.Left = Label3.Left - temp - 20
        Label1.Top = Label6.Top
        Label1.Width = Label2.Left - 630
        Label1.Left = 610
        Table.ColWidth(0) = Label6.Width - 30
        Table.ColWidth(1) = Label1.Width
        Table.ColWidth(2) = Label2.Width
        Table.ColWidth(3) = Label3.Width
        Table.ColWidth(4) = Label4.Width
        Table.ColWidth(5) = Label5.Width
        Table.ColWidth(6) = Label7.Width - 30
    Else
        Label6.Top = 10
        Label6.Width = 500
        Label6.Left = 100
        Label7.Top = Label6.Top
        Label7.Width = 1400
        Label7.Left = ScheduleTable.Width - Label7.Width - 480
        Label5.Top = Label6.Top
        Label5.Width = 1400
        Label5.Left = Label7.Left - Label5.Width - 20
        Label4.Top = Label6.Top
        Label4.Width = 1400
        Label4.Left = Label5.Left - Label4.Width - 20
        temp = Int((Label4.Left - 1000) / 3)
        Label3.Top = Label6.Top
        Label3.Width = temp
        Label3.Left = Label4.Left - temp - 20
        temp = Int((Label3.Left - 1000) / 2)
        Label2.Top = Label6.Top
        Label2.Width = temp
        Label2.Left = Label3.Left - temp - 20
        Label1.Top = Label6.Top
        Label1.Width = Label2.Left - 630
        Label1.Left = 610
        Table.ColWidth(0) = Label6.Width - 30
        Table.ColWidth(1) = Label1.Width
        Table.ColWidth(2) = Label2.Width
        Table.ColWidth(3) = Label3.Width
        Table.ColWidth(4) = Label4.Width
        Table.ColWidth(5) = Label5.Width
        Table.ColWidth(6) = Label7.Width - 25
    End If
End Sub
Sub Fill_Table()
    Dim NJob As Integer

    NJob = 32700
    Table.ColAlignment(0) = 1
    Table.ColAlignment(1) = 0
```

```
    Table.ColAlignment(2) = 0
    Table.ColAlignment(3) = 0
    Table.ColAlignment(4) = 1
    Table.ColAlignment(5) = 1
    Table.ColAlignment(6) = 1
    Dat.job.Recordset.MoveLast
    Dat.process.Recordset.MoveLast
    Dat.datas.Recordset.MoveLast
    Dat.job.Recordset.MoveFirst
    Dat.process.Recordset.MoveFirst
    Dat.datas.Recordset.MoveFirst
    Table.Rows = Dat.process.Recordset.RecordCount
    For i = 0 To Dat.process.Recordset.RecordCount - 1
        Dat.process.Recordset.AbsolutePosition = i
        Dat.datas.Recordset.AbsolutePosition = i
        Table.Row = i
        If Dat.process.Recordset("job_number") <> NJob Then
            NJob = Dat.process.Recordset("job_number")
            If i <> 0 Then Dat.job.Recordset.MoveNext
            Table.Col = 0
            Table.Text = Dat.job.Recordset.AbsolutePosition + 1
            Table.Col = 1
            Table.Text = Dat.job.Recordset("job_name")
        Else
            Table.Col = 0
            Table.Text = ""
            Table.Col = 1
            Table.Text = ""
        End If
        Table.Col = 2
        Table.Text = Dat.process.Recordset("process_name")
        Table.Col = 3
        Table.Text = Dat.process.Recordset("machine_name")
        Table.Col = 4
        Table.Text = Format(Dat.datas.Recordset("start"), "#,##0.00")
        Table.Col = 5
        Table.Text = Format(Dat.datas.Recordset("end"), "#,##0.00")
        Table.Col = 6
        Table.Text = Format(Dat.process.Recordset("processing_time"), "#,##0.00")
    Next i
End Sub
Private Sub Form_Activate()
    Arrange_form
End Sub

Private Sub Form_Resize()
    If ScheduleTable.WindowState <> 1 Then
        If ScheduleTable.Width < 9000 Then ScheduleTable.Width = 9000
        If ScheduleTable.Height < 3000 Then ScheduleTable.Height = 3000
        Arrange_form
    End If
End Sub


Private Sub Form_Unload(Cancel As Integer)
```

```
    ScheduleTable.Enabled = False
    ScheduleTable.Visible = False
    Unload ScheduleTable
    Main.Enabled = True
    Main.Visible = True
End Sub

Private Sub Quit_Click()
    ScheduleTable.Enabled = False
    ScheduleTable.Visible = False
    Unload ScheduleTable
    Main.Enabled = True
    Main.Visible = True
End Sub
```

```
VERSION 4.00
Begin VB.Form TimeUtilization
   Caption        =  "Scheduling Utilization Graph"
   ClientHeight   =  4890
   ClientLeft     =  1605
   ClientTop      =  1980
   ClientWidth    =  6615
   BeginProperty Font
      name           =  "MS Sans Serif"
      charset        =  222
      weight         =  700
      size           =  8.25
      underline      =  0   'False
      italic         =  0   'False
      strikethrough  =  0   'False
   EndProperty
   Height         =  5295
   Left           =  1545
   LinkTopic      =  "Form1"
   ScaleHeight    =  4890
   ScaleWidth     =  6615
   Top            =  1635
   Width          =  6735
   Begin VB.CommandButton CalData
      Caption        =  "Calculate"
      Height         =  255
      Left           =  1560
      TabIndex       =  5
      Top            =  4560
      Width          =  1095
   End
   Begin VB.TextBox McNum
      Alignment      =  1  'Right Justify
      Height         =  285
      Left           =  240
      TabIndex       =  4
      Top            =  4530
      Width          =  1335
   End
   Begin VB.PictureBox Graph
      AutoRedraw     =  -1  'True
      Height         =  3870
      Left           =  600
      ScaleHeight    =  3810
      ScaleWidth     =  5865
      TabIndex       =  3
      TabStop        =  0   'False
      Top            =  360
      Width          =  5925
   End
   Begin VB.PictureBox Number
      AutoRedraw     =  -1  'True
      Height         =  3855
      Left           =  0
      ScaleHeight    =  3795
```

```
    ScaleWidth      =   435
    TabIndex        =   2
    TabStop         =   0   'False
    Top             =   360
    Width           =   495
  End
  Begin VB.PictureBox Scale_X
    AutoRedraw      =   -1  'True
    Height          =   255
    Left            =   600
    ScaleHeight     =   195
    ScaleWidth      =   5835
    TabIndex        =   1
    TabStop         =   0   'False
    Top             =   0
    Width           =   5895
  End
  Begin VB.CommandButton Quit
    Caption         =   "&Close"
    Height          =   375
    Left            =   2760
    TabIndex        =   0
    Top             =   4440
    Width           =   1335
  End
  Begin VB.Label Label1
    AutoSize        =   -1  'True
    Caption         =   "Machine Index"
    Height          =   195
    Left            =   240
    TabIndex        =   6
    Top             =   4320
    Width           =   1245
  End
End
Attribute VB_Name = "TimeUtilization"
Attribute VB_Creatable = False
Attribute VB_Exposed = False
Dim X_size, Y_size As Long
Dim McIndex As Integer
Dim first_in As Boolean
Sub Arrange_form()
  scale_x.Height = 250
  scale_x.Top = 100
  Number.Left = 100
  Number.Width = 400
  Label1.Left = Number.Left
  Label1.Top = TimeUtilization.Height - 1000
  McNum.Left = Number.Left
  McNum.Top = TimeUtilization.Height - 800
  CalData.Left = McNum.Left + McNum.Width
  CalData.Top = McNum.Top + 20
  CalData.Height = McNum.Height - 20
  scale_x.Left = Number.Left + Number.Width + 50
  Number.Top = scale_x.Top + scale_x.Height + 50
```

```
    Graph.Left = scale_x.Left
    Graph.Top = Number.Top
    Quit.Left = Int((TimeUtilization.Width - Quit.Width) / 2)
    Quit.Top = TimeUtilization.Height - 900
    scale_x.Width = TimeUtilization.Width - Graph.Left - 200
    Number.Height = Quit.Top - Graph.Top - 200
    Graph.Width = scale_x.Width
    Graph.Height = Number.Height
    Output
End Sub

Sub Output()
    Dim found, Quit, select_First As Boolean
    Dim min, First As Integer
    Dim fCollect, fValue, cx, minValue As Double
    Dim pW, pY As Long
    Dim tKey As String

    Randomize
    Graph.Cls
    Number.Cls
    scale_x.Cls
    Graph.ForeColor = 0
    i = 0
    X_size = Int((scale_x.Width - 70) / Max_Time)
    Y_size = Int((Number.Height - 60) / 2)
    ScaleStep = Int(1100 / X_size)
    If ScaleStep = 0 Then ScaleStep = 1
    While i <= CInt(Max_Time)
        scale_x.CurrentX = i * X_size
        scale_x.CurrentY = scale_x.Height
        scale_x.Line Step(0, 0)-Step(0, -200), QBColor(0), BF
        temp = Str(i)
        temp = Right(temp, Len(temp) - 1)
        scale_x.CurrentX = scale_x.CurrentX + 20
        scale_x.CurrentY = 0
        scale_x.Print temp
        i = i + ScaleStep
    Wend
    For i = 0 To 1
        Number.CurrentX = 20
        Number.CurrentY = i * Y_size + Int(Y_size / 2) - 120
        Number.Print "U(t)"
        Graph.CurrentX = 0
        Graph.CurrentY = i * Y_size + 150
        Graph.Line Step(0, 0)-Step(Graph.Width, 0), QBColor(12)
        Graph.CurrentX = 0
        Graph.CurrentY = (i + 1) * Y_size - 150
        Graph.Line Step(0, 0)-Step(Graph.Width, 0), QBColor(12)
    Next i
    Number.CurrentX = 20
    Number.CurrentY = Y_size + Int(Y_size / 2) - 130
    Number.Line Step(0, 0)-Step(130, -15), QBColor(0), BF
    Quit = False
    fValue = 0
```

```
fCollect = 0
cx = 0
select_First = False
tKey = "machine_number = " & McIndex
Dat.datas.Recordset.FindFirst tKey
First = Dat.datas.Recordset.AbsolutePosition
While Not (Quit)
   Dat.datas.Recordset.FindFirst tKey
   min = Dat.datas.Recordset.AbsolutePosition
   If select_First Then
      minValue = 32700
   Else
      minValue = Dat.datas.Recordset("start")
   End If
   Dat.datas.Recordset.FindNext tKey
   While Not (Dat.datas.Recordset.NoMatch)
      If (Dat.datas.Recordset("start") >= cx) And (Dat.datas.Recordset("start") < minValue) Then
         min = Dat.datas.Recordset.AbsolutePosition
         minValue = Dat.datas.Recordset("start")
      End If
      Dat.datas.Recordset.FindNext tKey
   Wend
   If (min = First) And (select_First) Then
      Quit = True
   Else
      If min = First Then select_First = True
      Dat.datas.Recordset.AbsolutePosition = min
      Graph.CurrentX = cx * X_size
      Graph.CurrentY = 150
      If Int(Dat.datas.Recordset("start") - cx) > 0 Then
         pW = CInt((Dat.datas.Recordset("start") - cx) * X_size)
         Graph.Line Step(0, 0)-Step(0, Y_size - 300), QBColor(0)
         Graph.Line Step(0, 0)-Step(pW, 0), QBColor(0)
         Graph.Line Step(0, 0)-Step(0, -(Y_size - 300)), QBColor(0)
      End If
      pW = CInt((Dat.datas.Recordset("end") - Dat.datas.Recordset("start")) * X_size)
      Graph.Line Step(0, 0)-Step(pW, 0), QBColor(0)
      Graph.CurrentX = cx * X_size
      If cx = 0 Then
         If Dat.datas.Recordset("start") > 0 Then
            Graph.CurrentY = 2 * Y_size - 150
            pW = CInt((Dat.datas.Recordset("start") - cx) * X_size)
            Graph.Line Step(0, 0)-Step(pW, 0), QBColor(9)
         Else
            Graph.CurrentY = Y_size + 150
            fValue = 1
         End If
      Else
         Graph.CurrentY = 2 * Y_size - Int(fValue * (Y_size - 300)) - 150
         If Int(Dat.datas.Recordset("start") - cx) > 0 Then
            pW = CInt((Dat.datas.Recordset("start") - cx) * X_size)
            pY = CInt((fValue - (fCollect / Dat.datas.Recordset("start"))) * (Y_size - 300))
            Graph.Line Step(0, 0)-Step(pW, pY), QBColor(9)
            fValue = fCollect / Dat.datas.Recordset("start")
         End If
```

```
            End If
            fCollect = fCollect + Dat.datas.Recordset("end") - Dat.datas.Recordset("start")
            pW = CInt((Dat.datas.Recordset("end") - Dat.datas.Recordset("start")) * X_size)
            pY = CInt((fCollect / Dat.datas.Recordset("end") - fValue) * (Y_size - 300))
            Graph.Line Step(0, 0)-Step(pW, -pY), QBColor(9)
            fValue = fCollect / Dat.datas.Recordset("end")
            cx = Dat.datas.Recordset("end")
        End If
    Wend
End Sub


Private Sub CalData_Click()
    If McNum.Text = "" Then
        McIndex = 0
    Else
        McIndex = Val(McNum.Text) - 1
        If McIndex < 0 Then McIndex = 0
        If McIndex >= Dat.machine.Recordset.RecordCount Then
            McIndex = Dat.machine.Recordset.RecordCount - 1
        End If
        McNum.Text = Str(McIndex + 1)
    End If
    Output
End Sub

Private Sub Form_Activate()
    Randomize
    If first_in Then
        first_in = False
        McNum.Text = 1
    End If
    Arrange_form
End Sub

Private Sub Form_Load()
    first_in = True
End Sub

Private Sub Form_Resize()
    If WindowState <> 1 Then
        If TimeUtilization.Height < (2500 + Dat.machine.Recordset.RecordCount * 300) Then
            TimeUtilization.Height = (2500 + Dat.machine.Recordset.RecordCount * 300)
        End If
        If TimeUtilization.Width < 6500 Then
            TimeUtilization.Width = 6500
        End If
        Arrange_form
    End If
End Sub

Private Sub Form_Unload(Cancel As Integer)
    TimeUtilization.Enabled = False
    TimeUtilization.Visible = False
    Unload TimeUtilization
```

```
    Main.Enabled = True
    Main.Visible = True
    Main.SetFocus
End Sub

Private Sub McNum_KeyPress(KeyAscii As Integer)
    If KeyAscii = 13 Then CalData.SetFocus
End Sub

Private Sub Quit_Click()
    TimeUtilization.Enabled = False
    TimeUtilization.Visible = False
    Unload TimeUtilization
    Main.Enabled = True
    Main.Visible = True
    Main.SetFocus
End Sub
```

```
VERSION 4.00
Begin VB.Form Tprint
   BorderStyle     =  1  'Fixed Single
   Caption         =  "Print Form"
   ClientHeight    =  5625
   ClientLeft      =  1350
   ClientTop       =  1530
   ClientWidth     =  7200
   BeginProperty Font
      name            =  "MS Sans Serif"
      charset         =  222
      weight          =  700
      size            =  8.25
      underline       =  0   'False
      italic          =  0   'False
      strikethrough   =  0   'False
   EndProperty
   Height          =  6030
   Left            =  1290
   LinkTopic       =  "Form1"
   MaxButton       =  0   'False
   MinButton       =  0   'False
   ScaleHeight     =  5625
   ScaleWidth      =  7200
   Top             =  1185
   Width           =  7320
   Begin VB.OptionButton OptionB
      Caption         =  "&B Rescheduling Machine Chart"
      Height          =  195
      Left            =  3720
      TabIndex        =  12
      Top             =  2400
      Width           =  3375
   End
   Begin VB.OptionButton OptionA
      Caption         =  "&A Rescheduling Job Chart"
      Height          =  195
      Left            =  3720
      TabIndex        =  11
      Top             =  1920
      Width           =  2895
   End
   Begin VB.OptionButton Option5
      Caption         =  "&5 Scheduling Machine Chart"
      Height          =  195
      Left            =  120
      TabIndex        =  6
      Top             =  2400
      Width           =  3015
   End
   Begin VB.OptionButton Option4
      Caption         =  "&4 Scheduling Job Chart"
      Height          =  195
      Left            =  120
      TabIndex        =  5
```

```
  Top             =  1920
  Width           =  3135
End
Begin VB.CommandButton Close
  Caption         =  "&Cancel"
  Height          =  375
  Left            =  3960
  TabIndex        =  1
  Top             =  5160
  Width           =  1575
End
Begin VB.CommandButton Command1
  Caption         =  "&Print"
  Height          =  375
  Left            =  1800
  TabIndex        =  0
  Top             =  5160
  Width           =  1575
End
Begin VB.OptionButton OptionF
  Caption         =  "&F Rescheduling Machine Utilization"
  Height          =  195
  Left            =  3720
  TabIndex        =  16
  Top             =  4560
  Width           =  3495
End
Begin VB.OptionButton OptionE
  Caption         =  "&E Rescheduling Job Performance"
  Height          =  195
  Left            =  3720
  TabIndex        =  15
  Top             =  4080
  Width           =  3135
End
Begin VB.OptionButton OptionD
  Caption         =  "&D Rescheduling Machine Table"
  Height          =  195
  Left            =  3720
  TabIndex        =  14
  Top             =  3600
  Width           =  3015
End
Begin VB.OptionButton OptionC
  Caption         =  "&C Rescheduling Job Table"
  Height          =  195
  Left            =  3720
  TabIndex        =  13
  Top             =  3120
  Width           =  2895
End
Begin VB.OptionButton Option9
  Caption         =  "&9 Scheduling Machine Utilization"
  Height          =  195
  Left            =  120
```

```
    TabIndex        =  10
    Top             =  4560
    Width           =  3255
End
Begin VB.OptionButton Option8
    Caption         =  "&8 Scheduling Job Performance"
    Height          =  195
    Left            =  120
    TabIndex        =  9
    Top             =  4080
    Width           =  3015
End
Begin VB.OptionButton Option7
    Caption         =  "&7 Scheduling Machine Table"
    Height          =  195
    Left            =  120
    TabIndex        =  8
    Top             =  3600
    Width           =  2895
End
Begin VB.OptionButton Option6
    Caption         =  "&6 Scheduling Job Table"
    Height          =  195
    Left            =  120
    TabIndex        =  7
    Top             =  3120
    Width           =  2655
End
Begin VB.OptionButton Option3
    Caption         =  "&3 Machine Replacig Table"
    Height          =  195
    Left            =  120
    TabIndex        =  4
    Top             =  1200
    Width           =  2775
End
Begin VB.OptionButton Option2
    Caption         =  "&2 Machine Breakdown Time Table"
    Height          =  195
    Left            =  120
    TabIndex        =  3
    Top             =  720
    Width           =  3255
End
Begin VB.OptionButton Option1
    Caption         =  "&1 Job Table"
    Height          =  195
    Left            =  120
    TabIndex        =  2
    Top             =  240
    Width           =  2895
End
Begin Crystal.CrystalReport CReport
    Left            =  6360
    Top             =  240
```

```
    _ExtentX        =  741
    _ExtentY        =  741
    _StockProps     =  0
    ReportFileName  =  ""
    Destination     =  1
    WindowLeft      =  100
    WindowTop       =  100
    WindowWidth     =  490
    WindowHeight    =  300
    WindowTitle     =  ""
    WindowBorderStyle=  2
    WindowControlBox=  -1  'True
    WindowMaxButton =  -1  'True
    WindowMinButton =  -1  'True
    CopiesToPrinter =  1
    PrintFileName   =  "j:\Work2\Test.txt"
    PrintFileType   =  2
    SelectionFormula=  ""
    GroupSelectionFormula=  ""
    Connect         =  ""
    UserName        =  ""
    ReportSource    =  0
    BoundReportHeading=  ""
    BoundReportFooter=  0   'False
  End
End
Attribute VB_Name = "Tprint"
Attribute VB_Creatable = False
Attribute VB_Exposed = False
Dim oStartX, oStartY, oWidth, oHeight As Long
Dim tStartX, tStartY, dStartX, dStartY As Long

Sub oBox(ByVal X As Long, ByVal Y As Long, ByVal IX As Long, ByVal IY As Long, ByVal Message As String)
    pBox oStartX + X, Y + oStartY, IX, IY
    temp1 = Int((IX - Len(Message) * 93) / 2)
    temp2 = Int((IY - 93) / 2)
    pPrint oStartX + X + temp1, Y + oStartY + temp2, Message
End Sub

Sub oBBox(ByVal X As Long, ByVal Y As Long, ByVal IX As Long, ByVal IY As Long)
    pBox oStartX + X, Y + oStartY, IX, IY
    Printer.CurrentX = oStartX + X
    Printer.CurrentY = oStartY + Y
    Printer.Line Step(0, 0)-Step(IX, IY), QBColor(0)
    Printer.Line Step(0, -IY)-Step(-IX, IY), QBColor(0)
End Sub

Sub pBox(ByVal X As Long, ByVal Y As Long, ByVal IX As Long, ByVal IY As Long)
    Printer.CurrentX = X
    Printer.CurrentY = Y
    Printer.Line Step(0, 0)-Step(IX, IY), QBColor(0), B
End Sub
Sub pPrint(ByVal X As Long, ByVal Y As Long, ByVal Message As String)
    Printer.CurrentX = X
    Printer.CurrentY = Y
```

```
    Printer.Print Message
End Sub


Sub Print_JobChart()
    Dim ScaleStep, Current As Integer
    Dim PX_Size, PY_Size, pX, pY, pW As Long

    Randomize
    Printer.Font = Tprint.Font
    Printer.PaperSize = vbPRPSA4
    Printer.PrintQuality = vbPRPQHigh
    tStartX = 500
    tStartY = 500
    Printer.Font.Underline = True
    pPrint tStartX, tStartY, "Scheduling Job Gantt Chart ( " & ChartName & " )"
    Printer.Font.Underline = False
    cStartX = 1500
    cStartY = 1000
    cWidth = Printer.Width - 2000
    cHeight = Int(Printer.Height / 2)
    pBox cStartX, cStartY, cWidth, cHeight
    PX_Size = Int(cWidth / Max_Time)
    PY_Size = Int(cHeight / Dat.job.Recordset.RecordCount)
    Dat.job.Recordset.MoveFirst
    Current = Dat.job.Recordset("job_number")
    For i = 0 To Dat.datas.Recordset.RecordCount - 1
        Dat.datas.Recordset.AbsolutePosition = i
        Dat.process.Recordset.AbsolutePosition = i
        If (Current <> Dat.process.Recordset("job_number")) And (i > 0) Then
            Dat.job.Recordset.MoveNext
            Current = Dat.job.Recordset("job_number")
        End If
        pX = Int(Dat.datas.Recordset("start") * PX_Size)
        pY = (Dat.job.Recordset.AbsolutePosition) * PY_Size
        pW = Int((Dat.datas.Recordset("end") - Dat.datas.Recordset("start")) * PX_Size)
        If PY_Size > 1200 Then
            cBox pX, pY + Int((PY_Size - 1200) / 2), pW, 1200, Dat.datas.Recordset("Machine_Number") + 1
        Else
            cBox pX, pY, pW, PY_Size, Dat.datas.Recordset("machine_number") + 1
        End If
    Next i
    pY = cStartY + cHeight
    i = 0
    ScaleStep = Int(1000 / PX_Size)
    If ScaleStep = 0 Then ScaleStep = 1
    While i <= Max_Time
        Printer.CurrentX = i * PX_Size + cStartX
        Printer.CurrentY = pY
        Printer.Line Step(0, 0)-Step(0, 100), QBColor(0), B
        temp = Str(i)
        temp = Right(temp, Len(temp) - 1)
        Printer.CurrentX = i * PX_Size + cStartX - Int((Len(temp) * 93) / 2)
        Printer.CurrentY = pY + 150
        Printer.Print temp
```

```
        i = i + ScaleStep
    Wend
    For i = 1 To Dat.job.Recordset.RecordCount
        Printer.CurrentX = 500
        Printer.CurrentY = i * PY_Size - Int(PY_Size / 2) - 40 + oStartY
        Printer.Print i
    Next i
    Printer.EndDoc
End Sub


Sub Print_MachineChart()
    Dim ScaleStep As Integer
    Dim PX_Size, PY_Size, pX, pY, pW As Long

    Randomize
    Printer.Font = Tprint.Font
    Printer.PaperSize = vbPRPSA4
    Printer.PrintQuality = vbPRPQHigh
    tStartX = 500
    tStartY = 500
    Printer.Font.Underline = True
    pPrint tStartX, tStartY, "Scheduling Machine Gantt Chart ( " & ChartName & " )"
    Printer.Font.Underline = False
    oStartX = 1500
    oStartY = 1000
    oWidth = Printer.Width - 2000
    oHeight = Int(Printer.Height / 2)
    pBox oStartX, oStartY, oWidth, oHeight
    PX_Size = Int(oWidth / Max_Time)
    PY_Size = Int(oHeight / Dat.machine.Recordset.RecordCount)
    For i = 0 To Dat.datas.Recordset.RecordCount - 1
        Dat.datas.Recordset.AbsolutePosition = i
        pX = Int(Dat.datas.Recordset("start") * PX_Size)
        pY = (Dat.datas.Recordset("machine_number")) * PY_Size
        pW = Int((Dat.datas.Recordset("end") - Dat.datas.Recordset("start")) * PX_Size)
        If PY_Size > 1200 Then
            oBox pX, pY + Int((PY_Size - 1200) / 2), pW, 1200, Dat.datas.Recordset("process_id")
        Else
            oBox pX, pY, pW, PY_Size, Dat.datas.Recordset("process_id")
        End If
    Next i
    pY = oStartY + oHeight
    i = 0
    ScaleStep = Int(1000 / PX_Size)
    If ScaleStep = 0 Then ScaleStep = 1
    While i <= Max_Time
        Printer.CurrentX = i * PX_Size + oStartX
        Printer.CurrentY = pY
        Printer.Line Step(0, 0)-Step(0, 100), QBColor(0), B
        temp = Str(i)
        temp = Right(temp, Len(temp) - 1)
        Printer.CurrentX = i * PX_Size + oStartX - Int((Len(temp) * 93) / 2)
        Printer.CurrentY = pY + 150
        Printer.Print temp
```

```
        i = i + ScaleStep
    Wend
    For i = 1 To Dat.machine.Recordset.RecordCount
        Printer.CurrentX = 500
        Printer.CurrentY = i * PY_Size - Int(PY_Size / 2) - 40 + oStartY
        Printer.Print i
    Next i
    Printer.EndDoc
End Sub

Sub Print_RJobChart()
    Dim ScaleStep, Current As Integer
    Dim PX_Size, PY_Size, pX, pY, pW As Long

    Randomize
    Printer.Font = Tprint.Font
    Printer.PaperSize = vbPRPSA4
    Printer.PrintQuality = vbPRPQHigh
    tStartX = 500
    tStartY = 500
    Printer.Font.Underline = True
    pPrint tStartX, tStartY, "Rescheduling Job Gantt Chart ( " & RChartName & " )"
    Printer.Font.Underline = False
    oStartX = 1500
    oStartY = 1000
    oWidth = Printer.Width - 2000
    oHeight = Int(Printer.Height / 2)
    pBox oStartX, oStartY, oWidth, oHeight
    PX_Size = Int(oWidth / RMax_Time)
    PY_Size = Int(oHeight / Dat.job.Recordset.RecordCount)
    Dat.job.Recordset.MoveFirst
    Current = Dat.job.Recordset("job_number")
    For i = 0 To Dat.datas.Recordset.RecordCount - 1
        Dat.datas.Recordset.AbsolutePosition = i
        Dat.process.Recordset.AbsolutePosition = i
        If Dat.datas.Recordset("rstart") < Dat.datas.Recordset("rend") Then
            If (Current <> Dat.process.Recordset("job_number")) And (i > 0) Then
                Dat.job.Recordset.MoveNext
                Current = Dat.job.Recordset("job_number")
            End If
            pX = Int(Dat.datas.Recordset("rstart") * PX_Size)
            pY = (Dat.job.Recordset.AbsolutePosition) * PY_Size
            pW = Int((Dat.datas.Recordset("rend") - Dat.datas.Recordset("rstart")) * PX_Size)
            If PY_Size > 1200 Then
                oBox pX, pY + Int((PY_Size - 1200) / 2), pW, 1200, Dat.datas.Recordset("Machine_Number") + 1
            Else
                oBox pX, pY, pW, PY_Size, Dat.datas.Recordset("machine_number") + 1
            End If
        End If
    Next i
    If Dat.Replace.Recordset.RecordCount > 0 Then
        Dat.Replace.Recordset.MoveLast
        For i = 0 To Dat.Replace.Recordset.RecordCount - 1
            Dat.Replace.Recordset.AbsolutePosition = i
            Dat.datas.Recordset.AbsolutePosition = Dat.Replace.Recordset("operation")
```

```
            Dat.process.Recordset.AbsolutePosition = Dat.Replace.Recordset("operation")
            tKey = "job_number = " + Str(Dat.process.Recordset("job_number"))
            Dat.job.Recordset.FindFirst tKey
            pX = Int(Dat.Replace.Recordset("nstart") * PX_Size)
            pY = (Dat.job.Recordset.AbsolutePosition) * PY_Size
            pW = Int((Dat.Replace.Recordset("nstop") - Dat.Replace.Recordset("nstart")) * PX_Size)
            If PY_Size > 1200 Then
               oBox pX, pY + Int((PY_Size - 1200) / 2), pW, 1200, Dat.Replace.Recordset("Machine_num") + 1
            Else
               oBox pX, pY, pW, PY_Size, Dat.Replace.Recordset("machine_num") + 1
            End If
         Next i
      End If
      pY = oStartY + oHeight
      i = 0
      ScaleStep = Int(1000 / PX_Size)
      If ScaleStep = 0 Then ScaleStep = 1
      While i <= RMax_Time
         Printer.CurrentX = i * PX_Size + oStartX
         Printer.CurrentY = pY
         Printer.Line Step(0, 0)-Step(0, 100), QBColor(0), B
         temp = Str(i)
         temp = Right(temp, Len(temp) - 1)
         Printer.CurrentX = i * PX_Size + oStartX - Int((Len(temp) * 93) / 2)
         Printer.CurrentY = pY + 150
         Printer.Print temp
         i = i + ScaleStep
      Wend
      For i = 1 To Dat.job.Recordset.RecordCount
         Printer.CurrentX = 500
         Printer.CurrentY = i * PY_Size - Int(PY_Size / 2) - 40 + oStartY
         Printer.Print i
      Next i
      Printer.EndDoc
End Sub


Sub Print_RMachineChart()
   Dim ScaleStep As Integer
   Dim PX_Size, PY_Size, pX, pY, pW As Long

   Randomise
   Printer.Font = Tprint.Font
   Printer.PaperSize = vbPRPSA4
   Printer.PrintQuality = vbPRPQHigh
   tStartX = 500
   tStartY = 500
   Printer.Font.Underline = True
   pPrint tStartX, tStartY, "Rescheduling Machine Gantt Chart ( " & RChartName & " )"
   Printer.Font.Underline = False
   oStartX = 1500
   oStartY = 1000
   oWidth = Printer.Width - 2000
   oHeight = Int(Printer.Height / 2)
   pBox oStartX, oStartY, oWidth, oHeight
```

```
PX_Size = Int(oWidth / RMax_Time)
PY_Size = Int(oHeight / Dat.machine.Recordset.RecordCount)
For i = 0 To Dat.datas.Recordset.RecordCount - 1
   Dat.datas.Recordset.AbsolutePosition = i
   If Dat.datas.Recordset("rstart") < Dat.datas.Recordset("rend") Then
      pX = Int(Dat.datas.Recordset("rstart") * PX_Size)
      pY = (Dat.datas.Recordset("machine_number")) * PY_Size
      pW = Int((Dat.datas.Recordset("rend") - Dat.datas.Recordset("rstart")) * PX_Size)
      If PY_Size > 1200 Then
         oBox pX, pY + Int((PY_Size - 1200) / 2), pW, 1200, Dat.datas.Recordset("process_id")
      Else
         oBox pX, pY, pW, PY_Size, Dat.datas.Recordset("process_id")
      End If
   End If
Next i
If Dat.Replace.Recordset.RecordCount > 0 Then
   Dat.Replace.Recordset.MoveLast
   For i = 0 To Dat.Replace.Recordset.RecordCount - 1
      Dat.Replace.Recordset.AbsolutePosition = i
      Dat.datas.Recordset.AbsolutePosition = Dat.Replace.Recordset("operation")
      Dat.process.Recordset.AbsolutePosition = Dat.Replace.Recordset("operation")
      pX = Int(Dat.Replace.Recordset("rstart") * PX_Size)
      pY = (Dat.Replace.Recordset("machine_num")) * PY_Size
      pW = Int((Dat.Replace.Recordset("rstop") - Dat.Replace.Recordset("rstart")) * PX_Size)
      If PY_Size > 1200 Then
         oBox pX, pY + Int((PY_Size - 1200) / 2), pW, 1200, Dat.datas.Recordset("process_id")
      Else
         oBox pX, pY, pW, PY_Size, Dat.datas.Recordset("process_id")
      End If
   Next i
End If
pY = oStartY + oHeight
i = 0
ScaleStep = Int(1000 / PX_Size)
If ScaleStep = 0 Then ScaleStep = 1
While i <= RMax_Time
   Printer.CurrentX = i * PX_Size + oStartX
   Printer.CurrentY = pY
   Printer.Line Step(0, 0)-Step(0, 100), QBColor(0), B
   temp = Str(i)
   temp = Right(temp, Len(temp) - 1)
   Printer.CurrentX = i * PX_Size + oStartX - Int((Len(temp) * 93) / 2)
   Printer.CurrentY = pY + 150
   Printer.Print temp
   i = i + ScaleStep
Wend
For i = 1 To Dat.machine.Recordset.RecordCount
   Dat.machine.Recordset.AbsolutePosition = i - 1
   Printer.CurrentX = 500
   Printer.CurrentY = i * PY_Size - Int(PY_Size / 2) - 40 + oStartY
   Printer.Print i
   If Dat.machine.Recordset("b_stop") <> 0 Then
      pX = Int(Dat.machine.Recordset("b_start") * PX_Size)
      pY = (i - 1) * PY_Size
      pW = Int((Dat.machine.Recordset("b_stop") - Dat.machine.Recordset("b_start")) * PX_Size)
```

```
            If PY_Size > 1200 Then
               oBBox pX, pY + Int((PY_Size - 1200) / 2), pW, 1200
            Else
               oBBox pX, pY, pW, PY_Size
            End If
         End If
      Next i
      Printer.EndDoc
End Sub

Private Sub Close_Click()
      Tprint.Enabled = False
      Tprint.Visible = False
      Unload Tprint
      Main.SetFocus
End Sub

Private Sub Command1_Click()
      Dat.Enabled = False
      If Option1.Value Then
         CReport.ReportFileName = Pro_Path & "JT.rpt"
         Clear_Record Dat.print_data
         For i = 0 To Job_Table.Table.Rows - 1
            Job_Table.Table.Row = i
            Dat.print_data.Recordset.AddNew
            Job_Table.Table.Col = 0
            Dat.print_data.Recordset("Num1") = Job_Table.Table.Text
            Job_Table.Table.Col = 1
            Dat.print_data.Recordset("Str1") = Job_Table.Table.Text
            Job_Table.Table.Col = 2
            Dat.print_data.Recordset("Str2") = Job_Table.Table.Text
            Job_Table.Table.Col = 3
            Dat.print_data.Recordset("Str3") = Job_Table.Table.Text
            Job_Table.Table.Col = 4
            Dat.print_data.Recordset("Num2") = CDbl(Job_Table.Table.Text)
            Job_Table.Table.Col = 5
            Dat.print_data.Recordset("Num3") = CDbl(Job_Table.Table.Text)
            Dat.print_data.Recordset.Update
         Next i
         CReport.Action = 1
      ElseIf Option2 Then
         CReport.ReportFileName = Pro_Path & "MBTT.rpt"
         Clear_Record Dat.print_data
         For i = 0 To MachineBreak.Data.Rows - 1
            MachineBreak.Data.Row = i
            Dat.print_data.Recordset.AddNew
            MachineBreak.Data.Col = 0
            Dat.print_data.Recordset("Num1") = MachineBreak.Data.Text
            MachineBreak.Data.Col = 1
            Dat.print_data.Recordset("Str1") = MachineBreak.Data.Text
            MachineBreak.Data.Col = 2
            Dat.print_data.Recordset("Num2") = CDbl(MachineBreak.Data.Text)
            MachineBreak.Data.Col = 3
            Dat.print_data.Recordset("Num3") = CDbl(MachineBreak.Data.Text)
            Dat.print_data.Recordset.Update
```

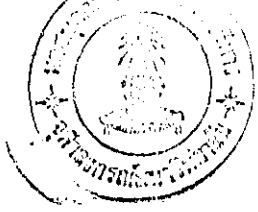
```
    Next i
    CReport.Action = 1
  Elseif Option3 Then
    CReport.ReportFileName = Pro_Path & "MRT.rpt"
    Clear_Record Dat.print_data
    For i = 0 To McReplace.Data.Rows - 1
      McReplace.Data.Row = i
      Dat.print_data.Recordset.AddNew
      McReplace.Data.Col = 0
      Dat.print_data.Recordset("Num1") = McReplace.Data.Text
      McReplace.Data.Col = 1
      Dat.print_data.Recordset("Str1") = McReplace.Data.Text
      McReplace.Data.Col = 2
      Dat.print_data.Recordset("Str2") = McReplace.Data.Text
      Dat.print_data.Recordset.Update
    Next i
    CReport.Action = 1
  Elseif Option4 Then
    Print_JobChart
  Elseif Option5 Then
    Print_MachineChart
  Elseif Option6 Then
    CReport.ReportFileName = Pro_Path & "SJT.rpt"
    Clear_Record Dat.print_data
    For i = 0 To ScheduleTable.Table.Rows - 1
      ScheduleTable.Table.Row = i
      Dat.print_data.Recordset.AddNew
      ScheduleTable.Table.Col = 0
      Dat.print_data.Recordset("Num1") = ScheduleTable.Table.Text
      ScheduleTable.Table.Col = 1
      Dat.print_data.Recordset("Str1") = ScheduleTable.Table.Text
      ScheduleTable.Table.Col = 2
      Dat.print_data.Recordset("Str2") = ScheduleTable.Table.Text
      ScheduleTable.Table.Col = 3
      Dat.print_data.Recordset("Str3") = ScheduleTable.Table.Text
      ScheduleTable.Table.Col = 4
      Dat.print_data.Recordset("Num2") = CDbl(ScheduleTable.Table.Text)
      ScheduleTable.Table.Col = 5
      Dat.print_data.Recordset("Num3") = CDbl(ScheduleTable.Table.Text)
      ScheduleTable.Table.Col = 6
      Dat.print_data.Recordset("Num4") = CDbl(ScheduleTable.Table.Text)
      Dat.print_data.Recordset.Update
    Next i
    CReport.Action = 1
  Elseif Option7 Then
    CReport.ReportFileName = Pro_Path & "SMT.rpt"
    Clear_Record Dat.print_data
    For i = 0 To JobTable.Table.Rows - 1
      JobTable.Table.Row = i
      Dat.print_data.Recordset.AddNew
      JobTable.Table.Col = 0
      Dat.print_data.Recordset("Num1") = JobTable.Table.Text
      JobTable.Table.Col = 1
      Dat.print_data.Recordset("Str1") = JobTable.Table.Text
      JobTable.Table.Col = 2
```

```
        Dat.print_data.Recordset("Str2") = JobTable.Table.Text
        JobTable.Table.Col = 3
        Dat.print_data.Recordset("Str3") = JobTable.Table.Text
        JobTable.Table.Col = 4
        Dat.print_data.Recordset("Num2") = CDbl(JobTable.Table.Text)
        JobTable.Table.Col = 5
        Dat.print_data.Recordset("Num3") = CDbl(JobTable.Table.Text)
        JobTable.Table.Col = 6
        Dat.print_data.Recordset("Num4") = CDbl(JobTable.Table.Text)
        Dat.print_data.Recordset.Update
    Next i
    CReport.Action = 1
ElseIf Option8 Then
    CReport.ReportFileName = Pro_Path & "SJP.rpt"
    Clear_Record Dat.print_data
    For i = 0 To Table.Data.Rows - 1
        Table.Data.Row = i
        Dat.print_data.Recordset.AddNew
        Table.Data.Col = 0
        Dat.print_data.Recordset("Num1") = Table.Data.Text
        Table.Data.Col = 1
        Dat.print_data.Recordset("Str1") = Table.Data.Text
        Table.Data.Col = 2
        Dat.print_data.Recordset("Num2") = CDbl(Table.Data.Text)
        Table.Data.Col = 3
        Dat.print_data.Recordset("Num3") = CDbl(Table.Data.Text)
        Table.Data.Col = 4
        Dat.print_data.Recordset("Num4") = CDbl(Table.Data.Text)
        Dat.print_data.Recordset.Update
    Next i
    CReport.Action = 1
ElseIf Option9 Then
    CReport.ReportFileName = Pro_Path & "SMU.rpt"
    Clear_Record Dat.print_data
    For i = 0 To McTable.Data.Rows - 1
        McTable.Data.Row = i
        Dat.print_data.Recordset.AddNew
        McTable.Data.Col = 0
        Dat.print_data.Recordset("Num1") = McTable.Data.Text
        McTable.Data.Col = 1
        Dat.print_data.Recordset("Str1") = McTable.Data.Text
        McTable.Data.Col = 2
        Dat.print_data.Recordset("Num2") = CDbl(McTable.Data.Text)
        Dat.print_data.Recordset.Update
    Next i
    CReport.Action = 1
ElseIf OptionA Then
    Print_RJobChart
ElseIf OptionB Then
    Print_RMachineChart
ElseIf OptionC Then
    CReport.ReportFileName = Pro_Path & "RJT.rpt"
    Clear_Record Dat.print_data
    For i = 0 To RescheduleTable.Table.Rows - 1
        RescheduleTable.Table.Row = i
```

```
        Dat.print_data.Recordset.AddNew
        RescheduleTable.Table.Col = 0
        Dat.print_data.Recordset("Num1") = RescheduleTable.Table.Text
        RescheduleTable.Table.Col = 1
        Dat.print_data.Recordset("Str1") = RescheduleTable.Table.Text
        Reschedule Table.Table.Col = 2
        Dat.print_data.Recordset("Str2") = RescheduleTable.Table.Text
        RescheduleTable.Table.Col = 3
        Dat.print_data.Recordset("Str3") = RescheduleTable.Table.Text
        RescheduleTable.Table.Col = 4
        Dat.print_data.Recordset("Num2") = CDbl(RescheduleTable.Table.Text)
        RescheduleTable.Table.Col = 5
        Dat.print_data.Recordset("Num3") = CDbl(RescheduleTable.Table.Text)
        RescheduleTable.Table.Col = 6
        Dat.print_data.Recordset("Num4") = CDbl(RescheduleTable.Table.Text)
        Dat.print_data.Recordset.Update
    Next i
    CReport.Action = 1
ElseIf OptionD Then
    CReport.ReportFileName = Pro_Path & "RMT.rpt"
    Clear_Record Dat.print_data
    For i = 0 To ReJobTable.Table.Rows - 1
        ReJobTable.Table.Row = i
        Dat.print_data.Recordset.AddNew
        ReJobTable.Table.Col = 0
        Dat.print_data.Recordset("Num1") = ReJobTable.Table.Text
        ReJobTable.Table.Col = 1
        Dat.print_data.Recordset("Str1") = ReJobTable.Table.Text
        ReJobTable.Table.Col = 2
        Dat.print_data.Recordset("Str2") = ReJobTable.Table.Text
        ReJobTable.Table.Col = 3
        Dat.print_data.Recordset("Str3") = ReJobTable.Table.Text
        ReJobTable.Table.Col = 4
        Dat.print_data.Recordset("Num2") = CDbl(ReJobTable.Table.Text)
        ReJobTable.Table.Col = 5
        Dat.print_data.Recordset("Num3") = CDbl(ReJobTable.Table.Text)
        ReJobTable.Table.Col = 6
        Dat.print_data.Recordset("Num4") = CDbl(ReJobTable.Table.Text)
        Dat.print_data.Recordset.Update
    Next i
    CReport.Action = 1
ElseIf OptionE Then
    CReport.ReportFileName = Pro_Path & "RJP.rpt"
    Clear_Record Dat.print_data
    For i = 0 To RTable.Data.Rows - 1
        RTable.Data.Row = i
        Dat.print_data.Recordset.AddNew
        RTable.Data.Col = 0
        Dat.print_data.Recordset("Num1") = RTable.Data.Text
        RTable.Data.Col = 1
        Dat.print_data.Recordset("Str1") = RTable.Data.Text
        RTable.Data.Col = 2
        Dat.print_data.Recordset("Num2") = CDbl(RTable.Data.Text)
        RTable.Data.Col = 3
        Dat.print_data.Recordset("Num3") = CDbl(RTable.Data.Text)
```

```
            RTable.Data.Col = 4
            Dat.print_data.Recordset("Num4") = CDbl(RTable.Data.Text)
            Dat.print_data.Recordset.Update
        Next i
        CReport.Action = 1
    ElseIf OptionF Then
        CReport.ReportFileName = Pro_Path & "RMU.rpt"
        Clear_Record Dat.print_data
        For i = 0 To RMcTable.Data.Rows - 1
            RMcTable.Data.Row = i
            Dat.print_data.Recordset.AddNew
            RMcTable.Data.Col = 0
            Dat.print_data.Recordset("Num1") = RMcTable.Data.Text
            RMcTable.Data.Col = 1
            Dat.print_data.Recordset("Str1") = RMcTable.Data.Text
            RMcTable.Data.Col = 2
            Dat.print_data.Recordset("Num2") = CDbl(RMcTable.Data.Text)
            Dat.print_data.Recordset.Update
        Next i
        CReport.Action = 1
    End If
    Tprint.Enabled = False
    Tprint.Visible = False
    Unload Tprint
    Main.SetFocus
End Sub


Private Sub Form_Load()
    If P_State = 1 Then
        Option2.Enabled = False
        Option3.Enabled = False
        Option4.Enabled = False
        Option5.Enabled = False
        Option6.Enabled = False
        Option7.Enabled = False
        Option8.Enabled = False
        Option9.Enabled = False
        OptionA.Enabled = False
        OptionB.Enabled = False
        OptionC.Enabled = False
        OptionD.Enabled = False
        OptionE.Enabled = False
        OptionF.Enabled = False
    ElseIf P_State = 2 Then
        OptionA.Enabled = False
        OptionB.Enabled = False
        OptionC.Enabled = False
        OptionD.Enabled = False
        OptionE.Enabled = False
        OptionF.Enabled = False
    End If
End Sub
```



ประวัติผู้เขียน

นางสาวปิยมาภรณ์ ชมสุวรรณ เกิดวันที่ 25 พฤษภาคม 2514 สำเร็จการศึกษาปริญญาวิทยาศาสตรบัณฑิต สาขาฟิสิกส์อุตสาหกรรมและอุปกรณ์การแพทย์ จากคณะวิทยาศาสตร์ประยุกต์ สถาบันเทคโนโลยีพระจอมเกล้าพระนครเหนือ ในปีการศึกษา 2537 และศึกษาต่อในระดับปริญญามหาบัณฑิต ภาควิชาวิศวกรรมอุตสาหการ คณะวิศวกรรมศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย ในปีการศึกษา 2538 ปัจจุบันทำงานในตำแหน่งวิศวกรคุณภาพ บริษัท ซีเกท เทคโนโลยี (ประเทศไทย) จำกัด