

บรรณานุกรม

- Gibbons, Jean Dickinson. Nonparametric Statistical Inference Science. New York: McGraw-Hill Kolgakusha LTD., 1971.
- Hogg, R.V., and Craig, A.T. Introduction to Mathematical Statistics, New York: The Macmillan Company, 1965.
- Siegel, Sidney. Nonparametric statistics for the Behavioral Science, New York: McGraw-Hill Kolgakusha LTD., 1956.

ภาคผนวก

```

10 REM ***** MAIN *****
20 HOME
30 SHOW$ = "Nonparametric Statistical Package Version 1.0"
40 PROGNAME$ = "<----- Nonparametric Main menu ----->"
50 VTAB(1):HTAB(15):PRINT PROGNAME$;
60 VTAB(4):HTAB(20):PRINT "<1> File handle routine";
70 VTAB(6):HTAB(20):PRINT "<2> Statistics Menu";
80 VTAB(8):HTAB(20):PRINT "<3> End of processing ";
90 VTAB(14):HTAB(20):PRINT "Select no. : ";
100 VTAB 20:HTAB 15:PRINT SHOW$;
110 ANS$ = " " :VTAB(14):HTAB(33):ANS%=INKEY$:IF ANS%="" THEN 110
120 PRINT ANS$;
130 IF INSTR("123",ANS%) <> 0 THEN 140 ELSE BEEP 20,20 :GOTO 110
140 ON VAL(ANS%) GOTO 150,160,170
150 GOSUB 190 :GOTO 20
160 RUN "STATMENU"
170 HOME :VTAB 12:HTAB 20:PRINT "<----- End of processing ----->";
180 SYSTEM
190 REM ----- CREATE FILE ROUTINE -----
200 REM ----- CDFRTN 18-08-86 -----
210 ON ERROR GOTO 20000
220 HDR$ = "Rec : ## Col : ## File : & Max.Col : B# Function : &"
230 DATAFL$=SPACES(8):FUNC$=" ? "
240 ROW=1:COL=1:FONT$="->"
250 ACTION$="ADPEXH"
260 HOME
270 PROGNM$ = "<----- File handle routine ----->"
280 PRINT SPC(20);PROGNM$
290 LINE INPUT "->Enter file name / <cr> exit to Main menu ";ANS%
300 IF ANS%="" THEN RETURN
310 IF LEN(ANS%) > 8 THEN ANS% = MID$(ANS%,1,8) ELSE ANS%=ANS%
320 DATAFL$="B:"+ANS%+".DAT"
330 CNTRL$="B:"+ANS%+".HDR"
340 RESET
350 NAME CNTRL$ AS "B:WORK"
360 NAME "B:WORK" AS CNTRL$
370 OPEN "r",#1,CNTRL$,4
380 FIELD #1,4 AS CNTRL.RECS
390 GET #1,1
400 NOREC = VAL(CNTRL.RECS)
410 IF NOREC THEN 430
420 NEWFILE$="Y"
430 OPEN "R",#2,DATAFL$,80
440 FIELD #2,80 AS RECORDS
450 IF NEWFILE$ = "Y" THEN CC=1:GOTO 500
460 REC=0:C=0:GOSUB 6020:PRINT PDMT$;"Enter function (Add/Edit/Print/Exit) ";CCOL=40
470 VTAB(CROW):HTAB(CCOL):ANS%=INKEY$:IF ANS% = " " THEN 470 ELSE PRINT ANS%
480 CC = INSTR(ACTION$,ANS%)
490 IF CC THEN 500 ELSE BEEP 20,20 :ANS% = " ":GOTO 470
500 ON CC GOSUB 1000,2000,3000,4000,5000,6000
510 REM      A   D   P   E   X   H
520 GOTO 460
1000 REM ----- ADD ROUTINE -----
1010 FUNC$="Add Record":BUFF$="":ANS%="":NOREC=NOREC+1:REC=NOREC : C = 1
1020 GOSUB 6020 :IF NEWFILE$ = "Y" THEN VTAB 24:HTAB 1:PRINT "->New file and function is Add record";
1030 VTAB(CROW):HTAB(CCOL):ANS%=INKEY$:IF ANS%="" THEN 1030
1040 IF INSTR("1234567890,+-",ANS%) THEN 1080
1050 IF ANS% = CHR$(13) THEN 1110
1060 IF ANS% = CHR$(8) AND BUFF% <> " " AND CCOL > 1 THEN CCOL = CCOL-1:BUFF%=MID$(BUFF%,1,LEN(BUFF%)-1)

```

תוכנית מנהל הנתונים MAIN.BAS

```

:HTAB(CCOL):PRINT SPC(1):VTAB(2):HTAB(17):PRINT USING "##";CCOL;:GOTO 1030
1070 BEEP 20,20:GOTO 1030
1080 PRINT ANS%;:CCOL = CCOL + 1 :VTAB(2):HTAB(17):PRINT USING "##";CCOL;:BUFF% = BUFF% + ANS%:ANS%=""
1090 IF CCOL > 80 THEN VTAB(CROW):HTAB(1):PRINT BUFF%;:GOTO 1120
1100 GOTO 1030
1110 IF BUFF% = "" THEN FUNC% = " ? " :NOREC = NOREC - 1 :RETURN
1120 REM
1130 LSET RECORD% = BUFF%
1140 PUT #2,NOREC :NOREC = NOREC + 1 : REC = NOREC :C = 1
1150 CROW=CROW+1:CCOL=1:BUFF%="":GOSUB 6120
1160 IF CROW < 23 THEN 1030 ELSE GOSUB 6020 : GOTO 1030
2000 REM ----- DELETE RECORD -----
2010 BEEP 20,20 :RETURN
3000 REM ----- PRINT DATA ROUTINE -----
3010 FUNC% = "Print file":CROW=CROW+1:CCOL=1
3020 VTAB(CROW):HTAB(CCOL):PRINT POMT%;"Please set your PRINTER ,If ready then (cr) "
3030 VTAB(CROW):HTAB(CCOL+46):ANS%=INKEY%:IF ANS%="" THEN 3030
3040 IF ANS% (<) CHR$(13) THEN BEEP 20,20 :GOTO 3030
3045 LPRINT CHR$(15);
3050 GOSUB 6150
3060 FOR I = 1 TO NOREC
3070 GET #2,I
3075 LPRINT USING "###";I;
3090 LPRINT SPC(1);RECORD%
3090 LLNN = LLNN +1: IF LLNN > 60 THEN GOSUB 6150
3100 NEXT I
3110 LPRINT:LPRINT TAB(30);"<----- End of file ----->"
3120 RETURN
4000 REM ----- EDIT ROUTINE -----
4010 FUNC% = "Edit record":BUFF% = "":REC=0:C=0:GOSUB 6020
4020 PRINT POMT%;"Edit record no. : ";
4030 NN=0:VTAB(CROW):HTAB(21):INPUT " ";NN
4040 IF NN = 0 THEN FUNC% = " ? " :RETURN
4050 IF NN > NOREC THEN VTAB(CROW):HTAB(40):PRINT NOREC;"Rec in file ";:BEEP 20,20 :GOTO 4030
4060 GET #2,NN :VTAB(2):HTAB(17):PRINT USING "###";NN;
4070 BUFF% = RECORD%
4080 CROW = CROW+1 :CCOL=1 :IF CROW >= 23 THEN REC = NN :C=0:GOSUB 6020
4090 V = CROW: C = CCOL
4100 VTAB(CROW):HTAB(CCOL):PRINT BUFF%
4110 VTAB(V):HTAB(C):ANS%=INKEY%:IF ANS%="" THEN 4110
4120 IF INSTR(" 0123456789+-.",ANS%) THEN 4170
4130 IF ANS%=CHR$(13) THEN 4190
4140 IF ANS%=CHR$(8) AND C > 1 THEN C=C-1:VTAB(2):HTAB(17):PRINT USING "##";C;:GOTO 4110
4150 IF ANS%=CHR$(9) AND C < 80 THEN C=C+1:VTAB(2):HTAB(17):PRINT USING "##";C;:GOTO 4110
4160 BEEP 20,20 :ANS%="" :GOTO 4110
4170 MID$(BUFF%,C,1) = ANS%:VTAB(V):HTAB(C):PRINT ANS%;:ANS%="" :C=C+1:VTAB(2):HTAB(17):PRINT USING "##";C;:GOTO 4
4180 IF C > 80 THEN C=1 :VTAB(2):HTAB(17):PRINT USING "##";C;:GOTO 4110 ELSE 4110
4190 LSET RECORD% = BUFF%
4200 PUT #2,NN :REC=0:C = 0
4210 CROW = CROW+1 :IF CROW > 23 THEN GOSUB 6020
4220 VTAB(CROW):HTAB(1):PRINT POMT%;"Record was updated "
4230 CROW=CROW+1:IF CROW > 23 THEN GOSUB 6020
4240 GOTO 4020
5000 REM ----- EXIT ROUTINE -----
5010 ANS%=SPC(NOREC)
5020 LSET CNTRL.REC% = ANS%
5030 PUT #1,1
5040 CLOSE #1,#2
5050 PRINT POMT%;"No. Record in file ":NOREC
5060 PRINT POMT%;"File ";DATAFL%;" was closed."
5070 FOR I = 1 TO 50 :NEXT I :RUN"MAIN"
6000 REM ----- HELP ROUTINE -----
6010 BEEP 20,20 :RETURN
6020 REM ----- set heading -----
6030 HOME
6040 VTAB(1):PRINT SPC(20);PROGRAM%
6050 VTAB(2):PRINT USING HDF%;PEC;C;DATAFL%;FUNC%
6060 VTAB(3):PRINT "1      10      20      30      40      50      60      70      80";

```

```

6070 FOR I = 1 TO 8
6080 PRINT "-----";
6090 NEXT I
6100 CROW=5 :CCOL = 1
6110 RETURN
6120 REM ----- PRINT HEAD
6130 VTAB(2):HTAB(1):PRINT USING HDR$;REC;C;DATAFL$;FUNC$;
6140 RETURN
6150 REM ----- LPRINT HEADING -----
6160 LPRINT CHR$(12)
6170 LLNN = 4
6180 LPRINT SPC(30);PROENM$
6190 LPRINT TAB(20);"file name : ":DATAFL$
6200 LPRINT TAB(5);"1      10      20      30      40      50      60      70      80"
6205 LPRINT TAB(5);
6210 FOR I = 1 TO 8
6220 LPRINT "-----";
6230 NEXT I
6235 LPRINT " "
6240 RETURN
20000 REM ----- ERROR ROUTINE -----
20010 IF ERL = 350 AND ERR = 53 THEN RESUME 370
20020 IF ERL = 360 AND ERR = 53 THEN PRINT "->Invalid file name ,Enter file name only":RESUME 290
20030 FOR I = 6 TO 20 :VTAB(1):HTAB(1):PRINT SPC(75):NEXT I
20040 IF ERR = 6 THEN MSG$ = "Overflow" :GOTO 20100
20050 IF ERR = 7 THEN MSG$ = "Out of memory" :GOTO 20100
20060 IF ERR = 11 THEN MSG$ = "Division by zero" :GOTO 20100
20070 IF ERR = 57 THEN MSG$ = "Disk I/O error" :GOTO 20100
20080 IF ERR = 61 THEN MSG$ = "Disk full" :GOTO 20100
20090 MSG$ = "Some error occurs"
20100 VTAB(23):HTAB(20):PRINT MSG$;" AT LINE NO. ";ERL
20110 VTAB(24):HTAB(20):PRINT "Press any key to return MAIN MENU";
20120 VTAB(24):HTAB(54): AA$ = INKEY$:IF AA$ = "" THEN 20120
20130 RESUME 10

```

```

10 REM ***** STAT MENU ***** 12-08-86
20 PROGRAM$ = "(----- Statistics Menu -----)"
30 ON ERROR GOTO 50000
40 DIM VAR$(9),MINS(9),MAX$(9),LENGTH$(9)
50 HOME : PRINT SPC(20);PROGRAM$
60 OPEN "R",01,"STATMSG.TXT",80
70 FIELD #1,33 AS MSG$,8 AS PGRM$,2 AS ROW$,2 AS COL$,35 AS XIX$
80 GET #1,1 : CNTRL$ = MSG$
90 FOR I = 2 TO 30
100 GET #1,I
110 ROW=VAL(ROW$):COL=VAL(COL$)
120 VTAB(ROW):HTAB(COL):PRINT MSG$;
130 NEXT I
140 VTAB(22):HTAB(20):PRINT "SELECT : "
150 VTAB(22):HTAB(30):ANS$ = INKEY$:IF ANS$ = "" THEN 150
160 IF ANS$ = " " THEN BEEP 20,20:GOTO 150
170 IF ANS$ >= "a" AND ANS$ <= "z" THEN ANS$=CHR$(ASC(ANS$)-32)
180 RECNO = INSTR(CNTRL$,ANS$):PRINT ANS$
190 IF RECNO = 0 THEN BEEP 20,20 :GOTO 150
200 GET #1,RECNO
210 STATNAME$ = MSG$ :PROGSTAT$=PGRM$:FLAG$=XIX$
215 IF ANS$ = "M" THEN RUN PROGSTAT$
220 CLOSE
240 REM
250 REM -----
260 HOME :PRINT SPC(14);PROGRAM$
265 VTAB(3):HTAB(1):PRINT "->Statistics name : ";STATNAME$;
270 REM ----- GET FILE NAME -----
280 FORT$ = "-)"
290 ROW=4:COL=1
300 VTAB(ROW):HTAB(COL):LINE INPUT "->Enter data file name :";FILENAME$
305 IF FILENAME$ = "" THEN RUN MAIN
310 IF LEN(FILENAME$) > 8 THEN FILENAME$ = MID$(FILENAME$,1,8)
320 FILENAME$ = "R:"+FILENAME$
330 OPEN "R",02,FILENAME$+".HDR",4
340 FIELD #2,4 AS HDR$
350 GET #2,1
360 IF VAL(HDR$) = 0 THEN 370 ELSE 420
370 CLOSE #2:BEEP 20,20
380 KILL FILENAME$+".HDR"
390 ROW=ROW+1:PRINT "->Invalid file name , Re-enter "
400 PRINT :FILES"B:".DAT": VTAB(24):HTAB(20):PRINT "(Cr) to return MAIN MENU";
410 GOTO 290
420 NOC = VAL(HDR$) : CLOSE #2
430 REM -----
440 REM -----
450 REM -----
460 NOV = VAL(MID$(FLAG$,1,1))
470 FOR I = 1 TO NOV
475 VAR$(I) = SPACE$(2):LENGTH$(I)=SPACE$(1)
480 IF MID$(FLAG$,1+2,1) = "N" THEN MINS(I)="N":MAX$(I)="N"
490 NEXT I
492 IF MID$(FLAG$,2,1) <> "A" THEN 500
494 FOR I = 1 TO NOV
496 MINS(I) = "ALL" : MAX$(I) = "ALL"
498 NEXT I
500 GOSUB 9000
510 WKVAR = 0
520 WHILE WKVAR < NOV
530 WKVAR = WKVAR+1
540 GOSUB 1000
550 IF NOV = 9 AND VAL(VAR$(WKVAR)) = 0 THEN NOV = WKVAR-1:GOTO 592
560 GOSUB 2000

```

ตัวแปรและโปรแกรม STATMENU.BAS

```

565     IF MID$(FLAGS,2,1) = "A" THEN 590
570     GOSUB 3000
580     GOSUB 4000
590 WEND
592 IF MID$(FLAGS,2,1) (<) "A" THEN 598
593 WKVAR = 1
594 GOSUB 3000
596 GOSUB 4000
597 FOR I = 2 TO NOV :MINS(I)=MINS(1):MAXS(I)=MAXS(1):NEXT I
598 GOSUB 9000
600 GOSUB 25000
610 IF ANS$="N" THEN 500
620 GOSUB 5000
630 RUN*GETVAR
640 STOP
1000 REM ----- GET VARIABLE NAME (COL) -----
1010 VTAB(21):HTAB(1):PRINT "->Enter COL(Variable) of Var.no."WKVAR;"
1020 ST$=SPACES(2):ROW=21:COL=38:GOSUB 20000
1030 IF VAL(ST$) > 80 THEN BEEP 20,20:VTAB(22):HTAB(1):PRINT "Invalid Col(Variable),Re-enter";GOTO 1010
1035 IF ST$ = " " AND VAL(MID$(FLAGS,1,1)) > 2 THEN RETURN
1037 IF ST$ = " " THEN BEEP 20,20 : GOTO 1020
1040 VARS(WKVAR)=ST$
1050 VTAB(K+WKVAR):HTAB(21):PRINT "V";VARS(WKVAR);
1060 FOR I = 21 TO 22 :VTAB(I):HTAB(1):PRINT SPC(60);:NEXT I
1070 RETURN
2000 REM ----- GET LENGTH -----
2010 VTAB(21):HTAB(1):PRINT USING "->Enter length of V& : ";VARS(WKVAR);
2020 ST$=SPACES(1):ROW=21:COL=25
2030 GOSUB 20000
2040 IF VAL(ST$) > 9 THEN VTAB(22):HTAB(1):PRINT "Invalid Length (Max. 9) ,Re-enter";GOTO 2010
2050 IF ST$ = " " THEN ST$=" 1"
2060 LENGTHS(WKVAR) = ST$
2070 VTAB(K+WKVAR):HTAB(34):PRINT LENGTHS(WKVAR);
2080 FOR I = 21 TO 22:VTAB(I):HTAB(1):PRINT SPC(60):NEXT I
2090 RETURN
3000 REM ----- GET LOW VALUE -----
3010 IF MINS(WKVAR) = "N" THEN VTAB(K+WKVAR):HTAB(46):PRINT "None";:RETURN
3012 IF MID$(FLAGS,2,1) (<) "A" THEN 3020
3014 VTAB(21):HTAB(1):PRINT "->Enter low value of all variable : ";
3015 VTAB(21):HTAB(37):ST$=INKEY$:IF ST$ = "" THEN 3015
3016 GOTO 3040
3020 VTAB(21):HTAB(1):PRINT USING "->Enter low value of V& : ";VARS(WKVAR);
3030 VTAB(21):HTAB(28):ST$=INKEY$:IF ST$="" THEN 3030
3040 IF INSTR("1234567890" ST$) (<) 0 THEN 3070
3050 VTAB(22):HTAB(1):PRINT "Invalid low value (Min.=1 Max.=9) ,Re-enter";
3060 BEEP 20,20 :GOTO 3012
3070 MINS(WKVAR) = ST$ : IF MID$(FLAGS,2,1) (<) "N" THEN 3090
3080 VTAB(K+WKVAR):HTAB(46):PRINT MINS(WKVAR);
3090 FOR I = 21 TO 22:VTAB(I):HTAB(1):VTAB(I):HTAB(1):PRINT SPC(60);:NEXT I
3100 RETURN
4000 REM ----- GET HIGH VALUE -----
4010 IF MAXS(WKVAR) = "N" THEN VTAB(K+WKVAR):HTAB(61):PRINT "None";:RETURN
4012 IF MID$(FLAGS,2,1) (<) "A" THEN 4020
4014 VTAB(21):HTAB(1):PRINT "->Enter high value of all variable : ";
4015 VTAB(21):HTAB(38):ST$=INKEY$:IF ST$ = "" THEN 4015
4016 GOTO 4040
4020 VTAB(21):HTAB(1):PRINT USING "->Enter high value of V& : ";VARS(WKVAR);
4030 VTAB(21):HTAB(29):ST$=INKEY$:IF ST$ = "" THEN 4030
4040 IF INSTR("1234567890" ST$) (<) 0 THEN 4070
4050 VTAB(22):HTAB(1):PRINT "Invalid high value (Min.=1 Max.=9) ,Re-enter";
4060 BEEP 20,20 :GOTO 4012
4070 MAXS(WKVAR) = ST$
4075 IF VAL(MINS(WKVAR)) => VAL(MAXS(WKVAR)) THEN 4050
4076 IF MID$(FLAGS,2,1) (<) "N" THEN 4090
4080 VTAB(K+WKVAR):HTAB(61):PRINT MAXS(WKVAR);
4090 FOR I=21 TO 22:VTAB(I):HTAB(1):PRINT SPC(60);:NEXT I
4100 RETURN

```



```

5000 REM ----- KEEP ALL DETAIL IN B:NONPAR.WK -----
5010 CLOSE :RESET
5020 OPEN "R",#1,"B:NONPAR.WK",80
5030 FIELD #1,10 AS FFNM$,33 AS STNM$,11 AS FFG$,4 AS NNOV$,4 AS NNDC$,8 AS PRG$,10 AS XIX$
5040 FIELD #1,80 AS YYY$
5050 LSET FFNM$ = FILENAME$
5060 LSET STNM$ = STATNAME$
5070 LSET FFG$ = MID$(FLAG$,1,11)
5080 LSET NNOV$ = M1$(NOV)
5090 LSET NNDC$ = M1$(NOC)
5095 LSET PRG$ = PRGSTAT$
5100 PUT #1,1
5110 FOR I = 1 TO NOV
5120   BUFF$ = BUFF$+VAR$(I)
5130   BUFF$ = BUFF$+LENGTH$(I)
5140   BUFF$ = BUFF$+MINS$(I)
5150   BUFF$ = BUFF$+MAX$(I)
5160 NEXT I
5170 LSET YYY$ = BUFF$
5180 PUT #1,2
5190 CLOSE :VTAB(23):HTAB(1):PRINT "### Wait a few minute , please ###";
5200 RETURN
9000 REM ----- Set screen -----
9010 HOME
9020 VTAB(1):HTAB(1):PRINT SPC(20);PROGNAME$;
9030 VTAB(3):HTAB(1):PRINT "->Statistics name :";STATNAME$;
9040 VTAB(4):HTAB(1):PRINT "->Data file : ";FILENAME$+".DAT";
9050 VTAB(5):HTAB(1):PRINT "->No. of record in file :";NOC;
9060 VTAB(6):HTAB(1):PRINT "->Variable :";NOV;
9070 VTAB(8):HTAB(1):PRINT SPC(5);"Var. no.";SPC(5);"Var.name";SPC(5);"Length";SPC(5);"Low value";SPC(5);"High value";
9080 VTAB(9):HTAB(1):PRINT STRING$(79,45);
9090 K = 10
9100 FOR I = 1 TO NOV
9110   VTAB(I+K):HTAB(9):PRINT I;
9120   VTAB(I+K):HTAB(21):PRINT VAR$(I);
9130   VTAB(I+K):HTAB(34):PRINT LENGTH$(I);
9140   VTAB(I+K):HTAB(46):IF MINS$(I) = "N" THEN PRINT "None"; ELSE PRINT MINS$(I);
9150   VTAB(I+K):HTAB(61):IF MAX$(I) = "N" THEN PRINT "None"; ELSE PRINT MAX$(I);
9160 NEXT I
9170 RETURN
20000 REM ----- INPUT ROUTINE -----
20010 REM ----- ROW = Row
20020 REM ----- COL = Col
20030 REM ----- ST$ = Output string
20040 POST = 1 :CCOL = COL
20050 VTAB(ROW):HTAB(CCOL):ANS$=INKEY$:IF ANS$="" THEN 20050
20060 IF INSTR("0123456789",ANS$) THEN 20110
20070 IF ANS$ = CHR$(8) AND CCOL > COL THEN CCOL = CCOL-1 :POST=POST-1:GOTO 20050
20080 IF ANS$ = CHR$(9) THEN ANS$ = " " :GOTO 20110
20090 IF ANS$ = CHR$(13) THEN RETURN
20100 BEEP 20,20 :GOTO 20050
20110 VTAB(ROW):HTAB(CCOL):PRINT ANS$;
20130 MID$(ST$,POST,1)=ANS$
20135 IF POST >= LEN(ST$) THEN RETURN
20140 ANS$="":CCOL=CCOL+1:POST=POST+1
20150 GOTO 20050
25000 REM ----- ACCEPT RTN -----
25010 VTAB(21):HTAB(1):PRINT "->Do you accept this variable list (Y/N) :";
25020 VTAB(21):HTAB(44):ANS$=INKEY$:IF ANS$ = "" THEN 25020
25025 PRINT ANS$;
25030 IF INSTR("YyNn",ANS$) (<) 0 THEN 25040 ELSE BEEP 20,20:GOTO 25020
25040 IF INSTR("Yy",ANS$) (<) 0 THEN 25100
25050 NOV = VAL(MID$(FLAG$,1,1)):ANS$="N"
25060 FOR I = 1 TO NOV
25070   VAR$(I)=SPACE$(2):LENGTH$(I)=SPACE$(1)
25080   IF MID$(FLAG$,I+2,1) = "N" THEN MINS$(I)="N":MAX$(I)="N"
25090 NEXT I
25100 RETURN

```



```
50000 REM ----- ERROR RTN -----
50010 IF ERL = 330 THEN BEEP 20,20 :PRINT "->Enter file name only":RESUME 290
50020 REM -----
50040 IF ERR = 6 THEN MSG$ = "Overflow" :GOTO 50100
50050 IF ERR = 7 THEN MSG$ = "Out of memory" :GOTO 50100
50060 IF ERR = 11 THEN MSG$ = "Division by zero" :GOTO 50100
50070 IF ERR = 57 THEN MSG$ = "Disk I/O error" :GOTO 50100
50080 IF ERR = 61 THEN MSG$ = "Disk full" :GOTO 50100
50090 MSG$ = "Some error occurs":RESUME 50110
50100 VTAB(23):HTAB(20):PRINT MSG$: " AT LINE NO. ";ERL
50110 VTAB(24):HTAB(20):PRINT "Press any key to return STAT MENU ";
50120 VTAB(24):HTAB(54): AA$ = INKEY$:IF AA$ = "" THEN 50120
50130 CHAIN "STATMENU"
```

```

10 REM ----- GET DATA FILE RTN --- 12-08-86
20 ON ERROR GOTO 320
30 CLOSE :RESET
40 OPEN "R", #1, "E:NONPAR.WK", 80
50 FIELD #1, 10 AS FFNN$, 33 AS STNN$, 11 AS FF66$, 4 AS NNOV$, 4 AS NNOC$, 8 AS PRGNN$, 10 AS IXX$
60 FIELD #1, 80 AS YYYY$
70 GET #1, 1
80 FILENAME$ = FFNN$ : STATNAME$ = STNN$ : NOV = CVS(NNOV$) : NOC = CVS(NNOC$) : PRGSTAT$ = PRGNN$
90 FLAG$ = FF66$
100 DIM IXX(NOV+3, NOC+1), MIN(NOV), MAX(NOV), LONG$(NOV), VAR$(NOV)
110 COMMON NOV, NOC, FILENAME$, STATNAME$, IXX(), MIN(), MAX(), VAR$()
120 GET #1, 2
130 POST = 0
140 FOR I = 1 TO NOV
150 VAR$(I) = MID$(YYYY$, I+POST, 2)
160 LONG(I) = VAL(MID$(YYYY$, I+POST+2, 1))
170 MIN(I) = VAL(MID$(YYYY$, I+POST+3, 1))
180 MAX(I) = VAL(MID$(YYYY$, I+POST+4, 1))
190 POST = POST + 4
200 NEXT I
210 CLOSE :RESET
220 OPEN "R", #1, FILENAME$+".DAT", 80
230 FIELD #1, 80 AS YYYY$
240 FOR I = 1 TO NOC
250 GET #1, 1
260 FOR J = 1 TO NOV
270 IF MID$(YYYY$, VAL(VAR$(J)), LONG(J)) = STRING$(LONG(J), 32) THEN IXX(J, I) = -99 :GOTO 250
280 IXX(J, I) = VAL(MID$(YYYY$, VAL(VAR$(J)), LONG(J)))
290 NEXT J
300 NEXT I
310 CHAIN PRGSTAT$
320 PRINT ERR, ERL; :STOP

```

ตัวอย่างโปรแกรม GETVAR.BAS

```

10 REM ***** ONE-BI *****
15 DIM V(9)
20 HOME
25 ON ERROR GOTO 5000
50 HTAB(20):VTAB(1):PRINT STATNAME$;
60 IF VAR$(1) = "" THEN GOTO 80
70 HTAB(30):VTAB(3):PRINT " V";VAR$(1)
75 HTAB(20):VTAB(12):PRINT "***** Wait a minute , please *****"
80 FOR I = 1 TO N0C
90 FOR J = MIN(1) TO MAX(1)
100 IF XXI(I,I) = J THEN V(J) = V(J)+1 :GOTO 130
110 NEXT J
120 MISSING = MISSING+1
130 NEXT I
140 NN = N0C-MISSING
145 IF V(1) >= V(2) THEN VV = V(2) : MIN = 2 ELSE VV = V(1) : MIN = 1
150 IF NN > 25 THEN GOTO 260
160 "BINOMIAL ROUTINE => N AND x
170 XX = 0 : PROBB1 = 0
180 FACN = 1:FACNX = 1:FACX = 1
190 IF XX > VV THEN GOTO 250
200 FOR I=1 TO NN :FACN = FACN+I :NEXT I
210 FOR I=1 TO NN-XX :FACNX = FACNX+I :NEXT I
220 FOR I=1 TO XX :FACX = FACX+I :NEXT I
230 PROBB1 = PROBB1+FACN*.5^NN/(FACX+FACNX)
240 XX = XX+1:GOTO 180
250 GOTO 360
260 VAR0 = SQR(NN*.5*.5)
270 MEAN0 = NN*.5
280 IF VV > N0C/2 THEN GOTO 300
290 Z0 = ((VV+.5)-MEAN0)/VAR0 :GOTO 310
300 Z0 = ((VV-.5)-MEAN0)/VAR0
310 T=1/(1+.33267*ABS(Z0))
320 R = EXP(-(Z0^2)/2)/2.506628270
330 T=1-P*(1.436184+T-.120167*T^2+.937298*T^3)
340 IF Z0 <= 0 THEN 360
350 T=1-T
360 HTAB(25):VTAB(6):PRINT "Code    frequency"
365 HTAB(20):VTAB(12):PRINT SPC(50)
370 HTAB(25):VTAB(7):PRINT STRING$(18,45)
380 HTAB(25):VTAB(8):PRINT;MIN(1);SPC(8);:PRINT USING "##";V(MIN(1))
390 HTAB(25):VTAB(9):PRINT;MAX(1);SPC(8);:PRINT USING "##";V(MAX(1))
400 HTAB(24):VTAB(10):PRINT"Missing";SPC(5);:PRINT USING "##";MISSING
410 HTAB(25):VTAB(11):PRINT STRING$(18,45)
420 IF N0C-MISSING > 25 THEN 490
430 MSG$ = "Prob ( X <= 0 ) = 0.0000 "
440 HTAB 10 :VTAB 14: PRINT USING MSG$;MIN;PROBB1
460 HTAB(10):VTAB(16):PRINT" when value of x is "
470 HTAB(30):VTAB(16):PRINT ;MIN
480 GOTO 540
490 HTAB(20):VTAB(12):PRINT "No of case > 25 => Approximate Normal distribution"
500 HTAB(20):VTAB(14):PRINT SPC(5);" Z = "
510 HTAB(32):VTAB(14):PRINT USING "###.###";Z0
520 HTAB(20):VTAB(16):PRINT SPC(5);" p = "
530 HTAB(33):VTAB(16):PRINT USING "0.###";T
540 HTAB(20):VTAB(23):PRINT "Do you want to print ? ( Y / N )"
550 HTAB(54):VTAB(23):P0=INPUT$(1)
560 IF P0 = "Y" OR P0 = "N" THEN 580
570 BEEP 20,60 :GOTO 550
580 IF P0 = "Y" THEN 60SUE 1000
590 REM COMMON FILENAME$,INFT$,PRT

```

ONE-BI.BAS

```

600 RUN *STATMENU
1000 * **** PRT-RTN
1010 IF PRT = 3 THEN LPRINT CHR$(12):PRT = 4 ELSE PRT = PRT+1
1020 LPRINT:LPRINT:TAB(25):STATNAME$ :LPRINT
1025 LPRINT:LPRINT TAB(30);"V";VAR$(1)
1030 LPRINT TAB(25);"Code   frequency"
1040 LPRINT TAB(25);STRING$(18,45)
1050 LPRINT TAB(25);MIN(1);SPC(8);:LPRINT USING "##";V(MIN(1))
1060 LPRINT TAB(25);MAX(1);SPC(8);:LPRINT USING "##";V(MAX(1))
1070 LPRINT TAB(24);"Missing";SPC(5);:LPRINT USING "##";MISSING
1080 LPRINT TAB(25);STRING$(18,45)
1090 LPRINT
1100 IF NN > 25 THEN 1180
1110 LPRINT TAB(10);:LPRINT USING MSE$;MIN;PROB$
1150 LPRINT TAB(10);"When value of x is ";MIN
1170 GOTO 1230
1180 LPRINT TAB(20);"No of case > 25 => Approximate normal distribution"
1190 LPRINT TAB(20);SPC(5);" Z = ";
1200 LPRINT USING "###.#####";Z
1210 LPRINT TAB(20);SPC(5);" p = ";SPC(3);
1220 LPRINT USING "0.#####";T
1230 LPRINT:LPRINT:STRING$(20,45)
1240 RETURN
5000 REM **** ERROR ROUTINE (ERR) ****
5010 IF ERR = 6 THEN EMS$ = "Overflow" :GOTO 5070
5020 IF ERR = 7 THEN EMS$ = "Out of memory" :GOTO 5070
5030 IF ERR = 11 THEN EMS$ = "Division by zero" :GOTO 5070
5040 IF ERR = 57 THEN EMS$ = "Disk I/O error" :GOTO 5070
5050 IF ERR = 61 THEN EMS$ = "Disk full" :GOTO 5070
5060 EMS$ = "Some error occurs":RESUME 5070
5070 VTAB(23):HTAB(20):PRINT EMS$;" AT LINE NO. ";ERL
5080 VTAB(24):HTAB(20):PRINT "Press any key to return STAT MENU ";
5090 VTAB(24):HTAB(54): AA$ = INKEY$:IF AA$ = "" THEN 5090
5100 RUN*STATMENU

```

```

10 REM ***** REL-WIL *****
20 HOME: DIM LO(20),HI(20),TT(20),P(20)
26 ON ERROR GOTO 5000
50 HTAB(20):VTAB(2):PRINT STATNAME$
60 FOR I = 1 TO NDC
70 J = J+1
80 IF XIX(1,I)-XIX(2,I) = 0 THEN J=J-1:ZERO=ZERO+1:GOTO 110
90 XIX(3,J) = XIX(1,I)-XIX(2,I)
100 IF XIX(3,J) > 0 THEN PLUS = PLUS+1 ELSE NEG = NEG+1
110 NEXT I
120 NDC = NDC-ZERO
130 HDR$ = "Vt by Vt"
135 HTAB 28 : VTAB 8 :PRINT USING HDR$;VAR$(1);VAR$(2)
140 HTAB(20):VTAB(10):PRINT "Difference   Frequency "
150 HTAB(20):VTAB(11):PRINT STRING$(24,45)
160 HTAB(24):VTAB(12):PRINT "+";SPC(12);PRINT USING "###";PLUS
170 HTAB(24):VTAB(13):PRINT "-";SPC(12);PRINT USING "###";NEG
180 HTAB(24):VTAB(14):PRINT "0";SPC(12);PRINT USING "###";ZERO
190 HTAB(20):VTAB(15):PRINT STRING$(24,45)
200 HTAB(23):VTAB(16):PRINT "Cases";SPC(9);PRINT USING "###";NDC+ZERO
205 HTAB(20):VTAB(18):PRINT "#### Wait a minute ,please ####"
210 '
220 ' QUICK SORT => SORT
230 '
240 PT=0:LO=1:HI=NDC
250 IF HI-LO <= 0 THEN GOTO 380
260 I = LO : J = HI
270 KREF = XIX(3,LO)
280 IF ABS(KREF) < ABS(XIX(3,J)) AND J > I THEN J = J-1 : GOTO 280
290 IF J < I THEN XIX(3,I) = KREF : GOTO 350
300 XIX(3,I) = XIX(3,J) : J = I+1
310 IF ABS(XIX(3,I)) < ABS(KREF) AND J > I THEN I = I+1 : GOTO 310
320 IF J < I THEN XIX(3,I) = KREF : I = J : GOTO 350
330 XIX(3,J) = XIX(3,I) : J = J-1
340 GOTO 280
350 IF (HI-I) < (I-LO) THEN GOTO 360 ELSE GOTO 370
360 P = P+1 : LO(P) = LO : HI(P) = I-1 : LO = I+1 : GOTO 250
370 P = P+1 : LO(P) = I+1 : HI(P) = HI : HI = I-1 : GOTO 250
380 IF P = 0 THEN GOTO 420
390 LO = LO(P) : HI = HI(P) : P = P-1
400 GOTO 250
410 'FANK
420 REP = -9999: CT = 0 : ST = 0
430 FOR I = 1 TO NDC+1
440 IF ABS(XIX(3,I)) = REP THEN GOTO 450 ELSE GOTO 460
450 CT = CT+1 : ST = ST+1 : GOTO 550
460 IF CT <= 0 THEN GOTO 520
470 R = ST/(CT+1)
480 FOR J = I-CT-1 TO I-1
490 XIX(4,J) = R
500 NEXT J
510 CT = 0
520 XIX(4,I) = 1
530 REP = ABS(XIX(3,I))
540 IF CT = 0 THEN ST = 1
550 NEXT I
560 IF PLUS < NEG THEN GOTO 610
570 FOR I = 1 TO NDC
580 IF XIX(3,I) < 0 THEN T = T+XIX(4,I)
590 NEXT I
600 GOTO 640
610 FOR I = 1 TO NDC

```

```

620 IF XXI(3,1) > 0 THEN T = T+XXI(4,1)
630 NEXT I
640 IF NDC > 25 GOTO 820
650 IF NDC > 6 GOTO 690
660 IF T < 0 THEN SIGN$ = ">" ELSE SIGN$ = "="
670 PROB = .05
680 GOTO 785
690 FOR I = 6 TO NDC
700 READ TT(1),TT(2),TT(3)
710 NEXT I
720 P(1) = .05:P(2) = .02:P(3) = .01
730 FOR I = 3 TO 1 STEP -1
740 IF T < TT(I) THEN K = I :GOTO 770
750 NEXT I
760 SIGN$ = ">" :PROB = .05 : GOTO 785
770 PROB = P(K)-(P(K)-P(K+1))*(TT(K)-T)/(TT(K)-TT(K+1))
780 SIGN$ = "="
785 HTAB(20):VTAB(18):PRINT SPC(50)
795 HTAB(30):VTAB(18):PRINT "T = ";T
800 HTAB(20):VTAB(19):PRINT "Two tail p ";SIGN$;" ";PROB
805 SMALL$ = "Y"
810 GOTO 950
820 MEAN = NDC*(NDC+1)/4
830 VAR = SQR(NDC*(NDC+1)*(2*NDC+1)/24)
840 Z0 = (T-MEAN)/VAR
850 TB = 1/(1+.33267*ABS(Z0))
860 R = EXP(-(Z0^2)/2)/2.506628270
870 TB = 1-R*(.436184+TB-.120167*TB^2+.937298*TB^3)
880 IF Z0 >= 0 THEN GOTO 895
890 TB = 1-TB
895 HTAB(20):VTAB(18):PRINT SPC(50)
900 HTAB(26):VTAB(18):PRINT "T = ";T
910 HTAB(20):VTAB(19):PRINT SPC(5);" Z = "
920 HTAB(30):VTAB(19):PRINT USING "###.#####";Z0
930 HTAB(20):VTAB(20):PRINT SPC(5);" p = "
940 HTAB(30):VTAB(20):PRINT USING "0.#####";TB
950 GOSUB 1500
970 RUN*STATMENU
975 DATA 0,0,0
980 DATA 2,0,0
990 DATA 4,2,0
1000 DATA 6,3,0
1010 DATA 8,5,3
1020 DATA 11,7,5
1030 DATA 14,10,7
1040 DATA 17,13,10
1050 DATA 21,16,13
1060 DATA 25,20,16
1070 DATA 30,24,20
1080 DATA 35,28,23
1090 DATA 40,33,28
1100 DATA 46,38,32
1110 DATA 52,43,38
1120 DATA 59,49,43
1130 DATA 66,56,49
1140 DATA 73,62,55
1150 DATA 81,69,61
1160 DATA 89,77,68
1500 HTAB(20):VTAB(23):PRINT "Do you want to print ? ( Y / N )"
1510 HTAB(54):VTAB(23):P$ = INPUT$(1)
1520 IF P$ = "Y" OR P$ = "N" THEN 1550
1530 BEEP 20,00
1540 GOTO 1510
1550 IF P$ <> "Y" THEN 1750
1551 IF PRT = 3 THEN LPRINT CHR$(12):PRT = 0 ELSE PRT = PRT+1
1552 LPRINT:LPRINT:LPRINT TAB(25);STATNAME$:LPRINT:LPRINT
1560 LPRINT TAB(28);

```

```

1570 LPRINT USING HDR$;VAR$(1);VAR$(2) :LPRINT
1580 LPRINT TAB(20);"Difference   Frequency "
1590 LPRINT TAB(26);STRING$(24,45)
1600 LPRINT TAB(24);"+";SPC(12);LPRINT USING "###";PLUS
1610 LPRINT TAB(24);"-";SPC(12);LPRINT USING "###";NEG
1620 LPRINT TAB(24);"0";SPC(12);LPRINT USING "###";ZERO
1630 LPRINT TAB(20);STRING$(24,45)
1640 LPRINT TAB(23);"CASES";SPC(9);:PRINT USING "###";NOC+ZERO
1650 IF SMALL$ (> "Y" THEN 1690
1660 LPRINT TAB(20);"T = ";T
1670 LPRINT TAB(20);"Two tail p ";SIGN$;" ";PROB
1680 GOTO 1740
1690 LPRINT TAB(26);"T = ";T
1700 LPRINT TAB(20);SPC(5);" Z = ";
1710 LPRINT USING "###.#####";Z
1720 LPRINT TAB(20);SPC(5);" p = ";
1730 LPRINT USING "0.#####";TB
1740 LPRINT:LPRINT:LPRINT STRING$(80,45)
1750 RETURN
5000 REM **** ERROR ROUTINE (ERR) ****
5010 IF ERR = 6 THEN EMS6$ = "Overflow" :GOTO 5070
5020 IF ERR = 7 THEN EMS6$ = "Out of memory" :GOTO 5070
5030 IF ERR = 11 THEN EMS6$ = "Division by zero" :GOTO 5070
5040 IF ERR = 57 THEN EMS6$ = "Disk I/O error" :GOTO 5070
5050 IF ERR = 61 THEN EMS6$ = "Disk full" :GOTO 5070
5060 EMS6$ = "Some error occurs":RESUME 5070
5070 VTAB(23):HTAB(20):PRINT EMS6$;" AT LINE NO. ";ERL
5080 VTAB(24):HTAB(20):PRINT "Press any key to return STAT MENU ";
5090 VTAB(24):HTAB(54): AA$ = INKEY$:IF AA$ = "" THEN 5090
5100 RUN"STATMENU

```

```

10 ***** IND-WAL *****
20 ON ERROR GOTO 5000
30 HOME :DIM K(NOC*2+1),IY(NOC*2+1),RK(NOC*2+1),HI(20),LO(20)
40 NMS = "THE WALD-WOLFDWITZ RUNS TEST"
50 HTAB(20):VTAB(2):PRINT STATNAME$;
60 HTAB(20):VTAB(12):PRINT "***** Wait a minute , please *****"
70 J = 1
80 FOR I = 1 TO NOC
90 IF IXX(1,I) = -99 THEN GOTO 130
100 K(J) = IXX(1,I)
110 IY(J) = I
120 J = J+1
130 NEXT I
140 NOX = J-1
150 FOR I = 1 TO NOC
160 IF IXX(2,I) = -99 THEN GOTO 200
170 K(J) = IXX(2,I)
180 IY(J) = 2
190 J = J+1
200 NEXT I
210 NOY = J - NOX - 1 :HIGH = J - 1
220 ***** SORT *****
230 P = 0:LO = 1:HI = HIGH
240 IF HI-LO =< 0 THEN GOTO 370
250 I = LO :J = HI
260 KREF = K(LO) :IY = IY(LO)
270 IF KREF < K(J) AND J > I THEN J = J-1 : GOTO 270
280 IF J =< I THEN K(I) = KREF :IY(I) = IY :GOTO 340
290 K(I) = K(J) : IY(I) = IY(J) : I = I+1
300 IF K(I) < KREF AND J > I THEN I = I+1 :GOTO 300
310 IF J =< I THEN K(I) = KREF : IY(I) = IY : I = J :GOTO 340
320 K(J) = K(I) : IY(J) = IY(I) : J = J-1
330 GOTO 270
340 IF (HI-I) < (I-LO) THEN GOTO 350 ELSE GOTO 360
350 P = P+1 :LO(P) = LO : HI(P) = I-1 : LO = I+1 :GOTO 240
360 P = P+1 : LO(P) = I+1 : HI(P) = HI : HI = I-1 :GOTO 240
370 IF P = 6 THEN GOTO 400
380 LO = LO(P) : HI = HI(P) : P = P-1
390 GOTO 240
400 ***** END OF SORT *****
410 ***** RANK *****
420 REP = -9999: CT = -1 : ST = 0
430 FOR I = 1 TO HIGH+1
440 IF K(I) = REP THEN GOTO 450 ELSE GOTO 460
450 CT = CT+1 :ST = ST+1 :GOTO 550
460 IF CT =< 0 THEN GOTO 520
470 R = ST/(CT+1)
480 FOR J = I-CT-1 TO I-1
490 RK(J) = R
500 NEXT J
510 CT = 0
520 RK(I) = I
530 REP = K(I)
540 IF CT = 0 THEN ST = I
550 NEXT I
560 ***** END OF RANK *****
570 DUMMY = IY(1) :RUNS = 1
580 FOR I = 2 TO HIGH
590 IF IY(I) <> DUMMY THEN RUNS = RUNS + 1 :DUMMY = IY(I)
600 NEXT I
610 IF NOX > 20 OR NOY > 20 THEN GOTO 770

```

IND-WAL.BAS


```

1290 DATA 00020303040405050606070708080808
1300 DATA 0002030304040505060607070808080809
1310 DATA 0002030404050506060707080808090909
1320 DATA 020203040405060607070808080909091010
1330 DATA 02020304050506060707080808090910101010
1340 DATA 02020304050506070708080809091010101111
1350 DATA 02030404050606070708080909101011111112
1360 DATA 02030404050606070808090910101111111212
1370 DATA 02030404050607070809091010111111121213
1380 DATA 02030405050607080809091010111112121313
1390 DATA 02030405060607080909101011121213131314
1400 DATA 02030405050607080909101011121213131314
5000 REM **** ERROR ROUTINE (ERR) ****
5010 IF ERR = 6 THEN EMS6$ = "Overflow" :GOTO 5070
5020 IF ERR = 7 THEN EMS6$ = "Out of memory" :GOTO 5070
5030 IF ERR = 11 THEN EMS6$ = "Division by zero" :GOTO 5070
5040 IF ERR = 57 THEN EMS6$ = "Disk I/O error" :GOTO 5070
5050 IF ERR = 61 THEN EMS6$ = "Disk full" :GOTO 5070
5060 EMS6$ = "Some error occurs":RESUME 5070
5070 VTAB(23):HTAB(20):PRINT EMS6$;" AT LINE NO. ";ERL
5080 VTAB(24):HTAB(20):PRINT "Press any key to return STAT MENU ";
5090 VTAB(24):HTAB(54):AA$ = INKEY$:IF AA$ = "" THEN 5090
5100 RUN*STATMENU

```

```

10 REM ***** K-COC *****
20 HOME:
26 ON ERROR GOTO 5000
40 NMS = "THE COCHRAN Q TEST"
50 HTAB(20):VTAB(2):PRINT STATNAME$;
56 HTAB(20):VTAB(12):PRINT "***** Wait a minute , please *****"
60 FOR I = 1 TO NOC
70 FOR J = 1 TO NOV
80 IF IXX(J,I) = MAX(J) THEN G(J) = G(J)+1:GG = GG+1
90 NEXT J
100 LL = LL + GG^2
110 GG = 0
120 NEXT J
130 FOR I = 1 TO NOV
140 L = L+G(I)
150 SUM6 = SUM6 + G(I)^2
160 NEXT I
170 GS0 = L^2
180 Q = ((NOV-1)*(NOV*SUM6 - GS0))/(NOV*L - LL)
190 CHI = Q
200 DF = NOV - 1
210 DF1 = DF
220 Y0 = CHI^(INT((DF1+1)/2))*EXP(-CHI/2)
230 FOR I = DF1 TO 2 STEP -2
240 Y1 = Y0/I
250 NEXT I
260 IF INT(DF1/2) = DF1/2 THEN GOTO 290
270 J = SQR(2/CHI/(1/22/7))
280 GOTO 300
290 J = 1
300 L0 = 1
310 M0 = 1
320 DF1 = DF1+2
330 M0 = M0*CHI/DF1
350 IF M0 < .000001 THEN GOTO 390
360 L0 = L0+M0
380 GOTO 320
390 PROB = 1-J+Y0*L0
400 HTAB(20):VTAB(12):PRINT SPC(50)
410 HTAB(15):VTAB(6):PRINT "All variable list"
420 HTAB(10):VTAB(7):PRINT "Code"
425 K = 0
430 FOR I = 1 TO NOV
440 HTAB(16+K):VTAB(7):PRINT USING "% 4";VAR$(I);
450 K = K + 5
460 NEXT I
470 HTAB(10):VTAB(8):PRINT STRING$(5*NOV+5,45)
480 HTAB(12):VTAB(9):PRINT MAX(I)
490 K = 0
500 FOR I = 1 TO NOV
510 HTAB(15+K):VTAB(9):PRINT USING "###";G(I);
520 K = I+5
530 NEXT I
540 HTAB(12):VTAB(10):PRINT MIN(I);
550 K = 0
560 FOR I = 1 TO NOV
570 HTAB(15+K):VTAB(10):PRINT USING "###";NOC-G(I);
580 K = K+5
590 NEXT I
595 HTAB(10):VTAB(11):PRINT STRING$(5*NOV+5,45)
600 HTAB(20):VTAB(12):PRINT "N of cases is ";NOC
610 HTAB(20):VTAB(13):PRINT "Q = ":Q

```



ตัวอย่างโปรแกรม K-COC.BAS

```

620 HTAB(20):VTAB(14):PRINT "p = ";
625 PRINT USING "00.0000";PROB
630 HTAB(20):VTAB(20):PRINT "Do you want to print ? ( Y / N )"
640 HTAB(55):VTAB(20):P% = INPUT$(1)
650 IF P% = "Y" OR P% = "N" THEN 670
660 BEEP 20,60 :GOTO 640
670 IF P% <> "Y" THEN 700
680 GOSUB 1000
700 RUN "STATMENU
1000 REM **** PRT-RTN
1010 IF PRT = 3 THEN LPRINT CHR$(12):PRT = 0 ELSE PRT = PRT+1
1020 LPRINT:LPRINT
1030 LPRINT TAB(20);STATNAME$
1040 LPRINT:LPRINT
1050 LPRINT TAB(15);"All variable list"
1060 LPRINT TAB(10);"Code";
1070 K = 0
1080 FOR I = 1 TO NOV
1090 LPRINT TAB(16+K);USING "% %";VAR$(I);
1100 K = K + 5
1110 NEXT I
1120 LPRINT TAB(10);STRING$(5+NOV*5,45)
1130 LPRINT TAB(12);MAX(1);
1140 K = 0
1150 FOR I = 1 TO NOV
1160 LPRINT TAB(15+K);USING "000";G(I);
1170 K = K+5
1180 NEXT I
1190 LPRINT TAB(12);MIN(1);
1200 K = 0
1210 FOR I = 1 TO NOV
1220 LPRINT TAB(15+K);USING "000";NOC-G(I);
1230 K = K+5
1240 NEXT I
1245 LPRINT TAB(10);STRING$(5+NOV*5,45)
1250 LPRINT TAB(20);"N of cases is ";NOC
1260 LPRINT TAB(20);"Q = ";Q
1270 LPRINT TAB(20);"p = ";
1280 LPRINT USING "00.0000";PROB
1290 LPRINT:LPRINT:LPRINT STRING$(80,45)
1300 RETURN
5000 REM **** ERROR ROUTINE (ERR) ****
5010 IF ERR = 6 THEN MSG$ = "Overflow" :GOTO 5070
5020 IF ERR = 7 THEN MSG$ = "Out of memory" :GOTO 5070
5030 IF ERR = 11 THEN MSG$ = "Division by zero" :GOTO 5070
5040 IF ERR = 57 THEN MSG$ = "Disk I/O error" :GOTO 5070
5050 IF ERR = 61 THEN MSG$ = "Disk full" :GOTO 5070
5060 MSG$ = "Some error occurs":RESUME 5070
5070 VTAB(23):HTAB(20):PRINT MSG$;" AT LINE NO. ";ERL
5080 VTAB(24):HTAB(20):PRINT "Press any key to return STAT MENU ";
5090 VTAB(24):HTAB(54): AA$ = INKEY$:IF AA$ = "" THEN 5090
5100 RUN"STATMENU

```

```

10 REM ***** K-KRU *****
20 HOME :DIM SUMRK(9),N(9),LO(20),HI(20)
26 ON ERROR GOTO 5000
40 NMS = "THE KRUSKAL-WALLIS ONE-WAY ANALYSIS OF VARIANCE BY RANK"
50 HTAB(25):VTAB(2):PRINT STATNAME$;
60 HTAB(20):VTAB(12):PRINT "#### Wait a minute , please ####"
70 J = 0
80 FOR I = 1 TO NOC
90 IF XXI(1,I) = -99 THEN MISS = MISS+1 :GOTO 130
100 J = J+1
110 XXI(3,J) = XXI(1,I)
120 XXI(4,J) = XXI(2,I)
130 NEXT I
140 NOC = NOC-MISS
150 REM ***** SORT *****
160 P = 0:LO = 1 :HI = NOC
170 IF HI-LO <= 0 THEN GOTO 300
180 I = LO :J = HI
190 KREF = XXI(3,LO) :XY = XXI(4,LO)
200 IF KREF < XXI(3,J) AND J > I THEN J = J-1 : GOTO 200
210 IF J <= I THEN XXI(3,I) = KREF :XXI(4,I) = XY :GOTO 270
220 XXI(3,I) = XXI(3,J) :XXI(4,I) = XXI(4,J):I = I+1
230 IF XXI(3,I) < KREF AND J > I THEN I = I+1 :GOTO 230
240 IF J <= I THEN XXI(3,I) = KREF :XXI(4,I) = XY :I = J :GOTO 270
250 XXI(3,J) = XXI(3,I) :XXI(4,J) = XXI(4,I) :J = J-1
260 GOTO 200
270 IF (HI-I) < (I-LO) THEN GOTO 280 ELSE GOTO 290
280 P = P+1 :LO(P) = LO :HI(P) = I-1 :LO = I+1 :GOTO 170
290 P = P+1 :LO(P) = I+1 :HI(P) = HI :HI = I-1 :GOTO 170
300 IF P = 0 THEN GOTO 330
310 LO = LO(P) :HI = HI(P) :P = P-1
320 GOTO 170
330 REM ***** END OF SORT *****
340 REM ***** RANK *****
350 REP = -9999: CT = 0 : ST = 0
360 FOR I = 1 TO NOC+1
370 IF XXI(3,I) = REP THEN GOTO 380 ELSE GOTO 390
380 CT = CT+1 :ST = ST+I :GOTO 490
390 IF CT <= 0 THEN GOTO 460
400 R = ST/(CT+1)
410 SUMT = SUMT + ((CT+1)^3 - (CT+1))
420 FOR J = I-CT-1 TO I-1
430 XXI(5,J) = R
440 NEXT J
450 CT = 0
460 XXI(5,I) = I
470 REP = XXI(3,I)
480 IF CT = 0 THEN ST = I
490 NEXT I
500 REM ***** END OF RANK *****
510 FOR I = 1 TO NOC
520 FOR J = MIN(2) TO MAX(2)
530 IF XXI(4,I) = J THEN SUMRK(J) = SUMRK(J)+XXI(5,I) :N(J) = N(J)+1 :GOTO 550
540 NEXT J
550 NEXT I
560 FOR I = MIN(2) TO MAX(2)-
570 H = H + (SUMRK(I)^2/N(I))
580 NEXT I
590 H = (12/(NOC*(NOC+1)))*H - (3*(NOC+1))
600 IF SUMT = 0 THEN GOTO 630
610 H = H / (1 - SUMT/(NOC*(NOC^2-1)))

```

ตัวกรองข้อมูล K-KRU.BAS

```

630 FOR I = MIN(2) TO MAX(2)
640 MRK(I) = SUMRK(I)/N(I)
650 NEXT I
660 HTAB(20):VTAB(12):PRINT SPC(50)
670 HTAB(25):VTAB(5):PRINT " V";VAR$(1);
690 K = 0
700 HTAB(9):VTAB(7):PRINT " V";VAR$(2)
710 FOR I = MIN(2) TO MAX(2)
720 HTAB(21+K):VTAB(7):PRINT I;
730 K = K+6
740 NEXT I
750 HTAB(20):VTAB(8):PRINT STRING$( (I-1)*6,45)
760 HTAB(5):VTAB(9):PRINT "Mean of rank"
770 K = 0
780 FOR I = MIN(2) TO MAX(2)
790 HTAB(20+K):VTAB(9):PRINT USING "###.0";MRK(I);
800 K = K+6
810 NEXT I
820 HTAB(5):VTAB(10):PRINT "N of class"
830 K = 0
840 FOR I = MIN(2) TO MAX(2)
850 HTAB(20+K):VTAB(10):PRINT USING "###";N(I);
860 K = K+6
870 NEXT I
875 HTAB(20):VTAB(11):PRINT STRING$(6*MAX(2),45)
880 HTAB(20):VTAB(14):PRINT "No of cases is ";NOC
890 HTAB(20):VTAB(15):PRINT "H = ";H
900 IF NOC > 15 THEN 930
910 HTAB(10):VTAB(15):PRINT "++++ N of cases < 16 : please look up table from annual +++++"
920 GOTO 1150
930 DF = MAX(2)-MIN(2)
940 DF1 = DF
950 CHI = H
960 K0 = CHI^(INT((DF1+1)/2))*EXP(-CHI/2)
970 FOR I = DF1 TO 2 STEP -2
980 K0 = K0/I
990 NEXT I
1000 IF INT(DF1/2) = DF1/2 THEN GOTO 1030
1010 J = SQR(2/CHI/(22/7))
1020 GOTO 1040
1030 J = 1
1040 L0 = 1
1050 M0 = 1
1060 DF1 = DF1+2
1070 M0 = M0+CHI/DF1
1090 IF M0 < .0000001 THEN GOTO 1130
1100 L0 = L0+M0
1120 GOTO 1060
1130 PROB = 1-J*K0*L0
1140 HTAB(20):VTAB(16):PRINT "p = ";
1141 PRINT USING "0.#####";PROB
1150 GOSUB 1500
1170 RUN "STATMENU"
1500 HTAB(20):VTAB(20):PRINT "Do you want to print ? ( Y / N ) "
1510 HTAB(55):VTAB(20):P$ = INPUT$(1)
1520 IF P$ = "Y" OR P$ = "N" THEN 1540
1530 BEEP 20,80 :GOTO 1510
1540 IF P$ <> "Y" THEN 1090
1550 REM +++++ PRT-RTN
1560 IF PRT = 3 THEN LPRINT CHR$(12):PRT = 0 ELSE PRT = PRT+1
1570 LPRINT:LPRINT:LPRINT TAB(25);STATNAME$
1580 LPRINT:LPRINT "
1590 LPRINT TAB(20);"          V";VAR$(1);
1610 K = 0
1620 LPRINT TAB(5);"          V";VAR$(2);
1630 FOR I = MIN(2) TO MAX(2)

```

```

1640 LPRINT TAB(21+K);I;
1650 K = K+6
1660 NEXT I
1670 LPRINT TAB(20);STRING$(I-1)*6,45)
1680 LPRINT TAB(5);"Mean of rank";
1690 K = 0
1700 FOR J = MIN(2) TO MAX(2)
1710 LPRINT TAB(20+K);USING "###.@";MRK(I);
1720 K = K+6
1730 NEXT J
1740 LPRINT:LPRINT
1750 LPRINT TAB(5);"No. of class";
1760 K = 0
1770 FOR J = MIN(2) TO MAX(2)
1780 LPRINT TAB(20+K);USING "###";N(I);
1790 K = K+6
1800 NEXT J
1805 LPRINT TAB(20);STRING$(6+MAX(2),45)
1810 LPRINT TAB(20);"N of cases is ";NOC
1820 LPRINT TAB(20);"H = ";H
1830 IF NOC > 15 THEN 1860
1840 LPRINT TAB(10);"++++ N of cases < 16 : please look up table from manual +++++"
1850 GOTO 1880
1860 LPRINT TAB(20);"p = ";
1870 LPRINT USING "0.###";PROB
1880 LPRINT:LPRINT:LPRINT STRING$(80,45)
1890 RETURN
5000 REM +--- ERROR ROUTINE (ERR) +---
5010 IF ERR = 6 THEN EMS6$ = "Overflow" :GOTO 5070
5020 IF ERR = 7 THEN EMS6$ = "Out of memory" :GOTO 5070
5030 IF ERR = 11 THEN EMS6$ = "Division by zero" :GOTO 5070
5040 IF ERR = 57 THEN EMS6$ = "Disk I/O error" :GOTO 5070
5050 IF ERR = 61 THEN EMS6$ = "Disk full" :GOTO 5070
5060 EMS6$ = "Some error occurs":RESUME 5070
5070 VTAB(23):HTAB(20):PRINT EMS6$;" AT LINE NO. ";ERL
5080 VTAB(24):HTAB(20):PRINT "Press any key to return STAT MENU ";
5090 VTAB(24):HTAB(54): AA$ = INKEY$:IF AA$ = "" THEN 5090
5100 RUN"STATMENU

```

```

10 REM ***** COR-SPE *****
20 HOME : DIM LD(20),HI(20)
40 NMI = "The Spearman correlation coefficient"
50 HTAB(20):VTAB(2):PRINT STATNAME$:
60 HTAB(20):VTAB(4):PRINT "      V";VAR$(1);" and V";VAR$(2)
65 HTAB(20):VTAB(12):PRINT "#### Wait a minute , please ####"
70 FOR I = 1 TO NOC
75 IF IXX(1,I) = -99 OR IXX(2,I) = -99 THEN MISSING = MISSING+1:GOTO 100
76 N = N + 1
80 X1(I,N) = IXX(1,I)
90 X2(I,N) = IXX(2,I)
100 NEXT I
105 NOC = NOC - MISSING
110 GOSUB 720
120 GOSUB 910
130 SUMX = (NOC^3 - NOC)/12 - SUMT
140 SUMT = 0
150 FOR I = 1 TO NOC
160 X1(2,I) = X1(5,I)
170 X1(5,I) = X1(4,I)
180 X1(4,I) = 0
190 NEXT I
200 FOR I = 1 TO NOC
210 X1(3,I) = X1(2,I)
220 NEXT I
230 GOSUB 720
240 GOSUB 910
250 SUMY = (NOC^3 - NOC)/12 - SUMT
260 FOR I = 1 TO NOC
270 SUMD = SUMD + (X1(5,I) - X1(4,I))^2
280 NEXT I
290 VAR = SUMX+SUMY
300 SD = SQR(VAR)
310 RS = (SUMX + SUMY - SUMD)/(2*SD)
320 IF NOC > 10 THEN GOTO 410
330 FOR I = 4 TO NOC
340 READ T1,T2
350 NEXT I
360 IF RS => T2 THEN SIGN$ = "<" :PROB = .01 :GOTO 390
370 IF RS => T1 THEN SIGN$ = "<" :PROB = .05 :GOTO 390
380 SIGN$ = ")" :PROB = .05
390 GOTO 590
400 REM ***** END OF SMALL SAMPLE *****
410 VAR = (NOC-2)/(1-RS^2)
420 SD = SQR(VAR)
430 T = RS*SD
440 D = NOC - 2 :T1 = T
450 X = 1 :Y = 1:T = T^2
460 IF T < 1 THEN GOTO 490
470 S = Y :R = D :I = T
480 GOTO 500
490 S = D :R = Y :I = 1/T
500 J = 2/9/S :K = 2/9/R
510 L = ABS((1-K)*I^(1/3)-1+J)/SQR(K*I^(2/3)+J)
520 IF R < 4 THEN GOTO 550
530 X = .25/(1+L*(.196854+L*(.115194+L*(.000344+L*(.019527))))^4
540 GOTO 570
550 L = L*(1+.00+L^4/R^3)
560 GOTO 530
570 IF T => 1 THEN 590
580 X = 1-X
590 HTAB(20):VTAB(6):PRINT "Spearman rank correlation coefficient (Rs) = ";RS
591 HTAB(20):VTAB(12):PRINT SPC(50)

```

ตัวแปรของโปรแกรม COR-SPE.BAS


```

600 HTAB(20):VTAB(7):PRINT "Number of cases is ";NOC
610 HTAB(20):VTAB(8):PRINT "Testing the significance of Rs ";
620 IF NOC > 10 THEN 660
630 PRINT " : p ";SIGN%;
640 PRINT USING "0.0000";PROB
650 GOTO 690
660 PRINT " "
670 HTAB(20):VTAB(9):PRINT " t = ";
671 PRINT USING "00.0000";TT;
672 PRINT " and df = ";D
680 HTAB(20):VTAB(10):PRINT " p = ";
681 PRINT USING "0.0000";X
690 GOSUB 4000
710 RUN*STATMENU
720 REM ***** SORT *****
730 P=0:LO=1:HI=NOC
740 IF HI-LO =< 0 THEN GOTO 870
750 I = LO : J = HI
760 KREF = XXX(3,LO) : RKX = XXX(5,LO)
770 IF KREF < XXX(3,J) AND J > I THEN J = J-1 : GOTO 770
780 IF J <= I THEN XXX(3,I) = KREF : XXX(5,I) = RKX : GOTO 840
790 XXX(3,I) = XXX(3,J) : XXX(5,I) = XXX(5,J) : I = I+1
800 IF XXX(3,I) < KREF AND J > I THEN I = I+1 : GOTO 800
810 IF J <= I THEN XXX(3,I) = KREF : XXX(5,I) = RKX : I = J : GOTO 840
820 XXX(3,J) = XXX(3,I) : XXX(5,J) = XXX(5,I) : J = J-1
830 GOTO 770
840 IF (HI-I) < (I-LO) THEN GOTO 850 ELSE GOTO 860
850 P = P+1 : LO(P) = LO : HI(P) = I-1 : LO = I+1 : GOTO 740
860 P = P+1 : LO(P) = I+1 : HI(P) = HI : HI = I-1 : GOTO 740
870 IF P = 0 THEN GOTO 900
880 LO = LO(P) : HI = HI(P) : P = P-1
890 GOTO 740
900 RETURN
910 REM ***** RANK *****
920 REP = -9999 : CT = 0 : ST = 0
930 FOR I = 1 TO NOC+1
940 IF XXX(3,I) = REP THEN GOTO 950 ELSE GOTO 960
950 CT = CT+1 : ST = ST+1 : GOTO 1060
960 IF CT =< 0 THEN GOTO 1030
970 R = ST/(CT+1)
980 SUMT = SUMT + ((CT+1)^3 - (CT+1))/12
990 FOR J = I-CT-1 TO I-1
1000 XXX(4,J) = R
1010 NEXT J
1020 CT = 0
1030 XXX(4,I) = I
1040 REP = XXX(3,I)
1050 IF CT = 0 THEN ST = I
1060 NEXT I
1070 RETURN
1080 REM ***** END OF RANK *****
4000 HTAB(20):VTAB(20):PRINT "Do you want to print ? ( Y / N )"
4010 HTAB(55):VTAB(26):P8 = INPUT$(1)
4020 IF P8 = "Y" OR P8 = "N" THEN 4040
4030 REEF 20,80 : GOTO 4010
4040 IF P8 <> "Y" THEN 4180
4050 IF PRT = 3 THEN LPRINT CHR$(12):PRT = 0 ELSE PRT = PRT+1
4060 LPRINT:LPRINT:LPRINT TAB(20);STATNAME$;LPRINT:LPRINT
4070 LPRINT TAB(20);"          V";VAR$(1);" and V";VAR$(2)
4080 LPRINT:LPRINT
4090 LPRINT TAB(20);"Spearman rank correlation coefficient (Rs) = ";RS
4100 LPRINT TAB(20);"Number of cases is ";NOC
4110 LPRINT TAB(20);"Testing the significance of Rs ";
4120 IF NOC > 10 THEN 4160
4130 LPRINT " : p ";SIGN%;
4140 LPRINT USING "0.0000";PROB
4150 GOTO 4180
4160 LPRINT TAB(20);" t = ";:LPRINT USING "00.0000";TT;:LPRINT " AND df = ";D

```

```
4170 LPRINT TAB(20); " p = ";LPRINT USING "0.0000";X
4175 LPRINT :LPRINT :LPRINT STRING$(@e,45)
4180 RETURN
5000 REM **** ERROR ROUTINE (ERR) ****
5010 IF ERR = 6 THEN EMS6$ = "Overflow" :GOTO 5070
5020 IF ERR = 7 THEN EMS6$ = "Out of memory" :GOTO 5070
5030 IF ERR = 11 THEN EMS6$ = "Division by zero" :GOTO 5070
5040 IF ERR = 57 THEN EMS6$ = "Disk I/O error" :GOTO 5070
5050 IF ERR = 61 THEN EMS6$ = "Disk full" :GOTO 5070
5060 EMS6$ = "Some error occurs":RESUME 5070
5070 VTAB(23):HTAB(20):PRINT EMS6$;" AT LINE NO. ";ERL
5080 VTAB(24):HTAB(20):PRINT "Press any key to return STAT MENU ";
5090 VTAB(24):HTAB(54): AA$ = INKEY$:IF AA$ = "" THEN 5090
5100 RUN*STATMENU
```

ประวัติผู้วิจัย

นาย สมเกียรติ พงศ์จรรยากุล เกิดวันที่ 30 เมษายน 2499 ที่
จังหวัดอุบลราชธานี สำเร็จการศึกษาจากคณะศึกษาศาสตร์ (คณิตศาสตร์)
มหาวิทยาลัยขอนแก่น ในปี พ.ศ. 2520

