รายการอ้างอิง

ภาษาไทย

ปรีชา อัศวเดชานุกร. การประมาณค่าพารามิเตอร์เมื่อมีผู้ไม่ตอบสัมภาษณ์จากการสำรวจตัวอย่าง . วิทยานิพนธ์ปริญญาสถิติศาสตร์ สาขาวิชาสถิติ บัณฑิตวิทยาลัยจุฬาลงกรณ์มหาวิทยาลัย ,2524

วิไลพร ธรรมเนียมอินทร์.การศึกษาเปรียบเทียบวิธีการประมาณค่าพารามิเตอร์ในฟังก์ชันการแจกแจงแบบปกติที่มีค่าไคสแควร์จากการทดลองภาวะสารูปสนิทดีมีค่าต่ำสุด. วิทยานิพนธ์ปริญญามหาบัณฑิต ภาควิชาสถิติ บัณฑิตวิทยาลัย,2524

สุชาดา กีระนันท์. การสำรวจตัวอย่าง . กรุงเทพมหานคร: ภาควิชาสถิติ จุฬาลงกรณ์มหาวิทยาลัย ,2525(พิมพ์ดีด)

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ภาคผนวก

ภาคผนวก

โปรแกรมที่ใช้ในการวิจัย

```
/INC OSJE
SYSTEM='VSE'
* $$ JOB JNM=ZECZNS30,CLASS=6
* $$ PRT CLASS=M,DEST=(,MUSIC)
// JOB ZECZNS30
// OPTION LINK,NODUMP
// EXEC VFORTRAN,SIZE=AUTO
      DIMENSION XX(2000,3),YA(2000),BET(3),E(2000),XA(2000,3),
     *PXA(2000,3),PYA(2000),VP(6),VRN(6),AD(6,6),
     *Y(2000),TB(3),TB1(3),TB2(3),TB3(3),BB1(3),BB2(3),BB3(3),
     *YB(400),XB(400,3),YC(380),YD(160),XD(160,3),XC(380,3),
     *YE(160),YF(80),XE(160,3),XF(80,3),PY(3),XXC(380),YN2(200),
     *X2C(380),YT1(380),YT2(380),YT3(380),XT1(380,3),XT2(380,3),
     *CX(2,3,3),XT3(380,3),PP(3),YN1(200),TB4(3),TB5(3),TB6(3),
     *YN3(200),YK(380),XK(3,380),ATT1(3,380),ATT2(3,380),ATT3(3,380)
      DOUBLE PRECISION A(3,3),SUMB,SUMBB,SUMC,SUMCC,SUMF,SUMFF,SUMC1
    *,SUMC2,SUMN1,SUMNN1,SUMN2,SUMNN2,SMN,SMNN,SMN1
    *SMN2,SUMP,SUMPP,
     *SMP,SMPP
      REAL CR,RM
      COMMON IX,L1
      READ(5,12)SMEAN1,SIGMA1
   12 FORMAT(F4.1,F4.2)
      READ(5,10)SMEAN2,SIGMA2
   10 FORMAT(F4.1,F4.2)
      KP=2
      K1=KP+1
      N=2000
      L1=
```

```
C     ****************************************
C     GENERATE FIXED INDEPENDENT VARIABLE
C     ****************************************
      ALP=100
      DO 14 I=1,K1
      BET(I)=1.
14    CONTINUE
      IX=53013
C     IX =973253
C     ************************
      DO 16 J=2,K1
      DO 18 I=1,N
      CALL NORMAL(SMEAN1,SIGMA1,XX(I,J))
18    CONTINUE
16    CONTINUE
C     ****************************************
C     GENERATE ERROR&DEPENDENT VARIABLE
C     ****************************************
      DO 20 I=1,N
      CALL NORMAL(SMEAN2,SIGMA2,E(I))
20    CONTINUE
      DO 22 I=1,N
      SBA=0.
      DO 24 J=2,K1
      SBA= SBA+(BET(J)*XX(I,J))
24    CONTINUE
      Y(I)= ALP +SBA+E(I)
22    CONTINUE
      DO 28 I=1,N
      XX(I,1)=1.
```

```
28    CONTINUE
      DO 11 I=1,N
      DO 13 J=1,K1
      PXA(I,J)=XX(I,J)
13    CONTINUE
11    CONTINUE
      DO 229 I=1,N
      PYA(I)=Y(I)
229   CONTINUE
      DO 1111 LLK=1,16
      READ(5,111)NN,M,N2P
111   FORMAT(I3,I3,I2)
C     NN=400
C     M=240
C     NTP=64
      NTS=750
      TS=NTS
      NTR=NTS
      YBRA1=0.
      YBRA2=0.
      YBRA3=0.
      YBRA4=0.
      YBRA5=0.
      YBRA6=0.
      YBRA7=0.
      TS1=0.
      TS2=0.
      TS3=0.
      TS4=0.
      TS5=0.
```

```
      TS6=0.
      APE1=0.
      APE2=0.
      APE4=0.
      APE5=0.
      APE6=0.
      APE7=0.
      SUMA=0.
      SUMB=0.
      DO 3810 I=1,6
      DO 3811 J=1,6
      AD(I,J)=0
3811  CONTINUE
3810  CONTINUE
      WRITE(6,4911)N,NN,M,N2P,NTS
4911  FORMAT(////'   N =',I6,3X,'NN=',I5,3X,'M=',I5,3X,'N2P=',I4
     *,3X,'NTS=',I4)
      DO 8899 IJK=1,NTS
      DO 1901 I=1,N
      YA(I)=PYA(I)
      DO 1903 J=1,K1
      XA(I,J)=PXA(I,J)
1903  CONTINUE
1901  CONTINUE
      DO 1995 I=1,3
      PP(I)=0.
1995  CONTINUE
C     ------------------------------------------
C     WRITE VALUE OF Y(I)&X(I) AFTER GENERATE
C     ------------------------------------------
```

```
C     DO 228 I=1,N
C     WRITE(6,101)YA(I)
C101   FORMAT(3X,F12.2)
C     DO 222 J=1,K1
C      WRITE(6,102)(XA(I,J),J=1,K1)
C102   FORMAT(2X,2(2X,F14.6))
C222   CONTINUE
C228   CONTINUE
C     ------------------------------------
C          SAMPLING NN FROM N
C      N:NUMBER OF POPULATION
C      NN:NUMBER OF SAMPLE
C      Y: VALUE OF SAMPLE
C     ------------------------------------
      DO 41 K=1,NN
    1 CALL RANDU(IX,IY,YFL)
      IR=INT(YFL*N+1)
      IF(YA(IR).GT.0.) THEN
      YB(K)=YA(IR)
      YA(IR)=0.
      DO 42 J=1,K1
      XB(K,J)=XA(IR,J)
 42   CONTINUE
      ELSE
      GOTO 1
      ENDIF
 41   CONTINUE
C     ------------------------------------
C     WRITE Y(I)&X(I)AFTER SAMPLING
C     SIZ=NN
```

```
C     ------------------------------------
C     WRITE(6,251)
C251  FORMAT(//5X,'___________SAMPLE___________')
C     DO 302 I=1,NN
C     WRITE(6,125)YB(I)
C125  FORMAT(3X,F12.2)
C     WRITE(6,126)(XB(I,J),J=1,K1)
C126  FORMAT(2X,2(2X,F14.6))
C302  CONTINUE
      CALL STAT(YB,NN,YBBRA,SUMB,SUMBB)
      VR1=(SUMBB-SUMB**2/NN)/(NN-1)
      VRN1=VR1/NN
C     WRITE(6,137)YBBRA
C137  FORMAT(//5X,'SAMPLE MEAN =',F12.4)
C     ------------------------------------------
C     SEPARATING FOR RESPONSE & NONRESPONSE
C     ------------------------------------------
      W=1
      NM=NN-M
      IA1=(NN/M)
      DO 43 I1=1,M
      I=W+(I1-1)*IA1
      YC(I1)=YB(I)
      YB(I)=0.
      DO 44 J=1,K1
      XC(I1,J)=XB(I,J)
44    CONTINUE
43    CONTINUE
      DO 155 JA=1,M
      YK(JA)=YC(JA)
```

```
      DO 157 JB=1,K1
      XK(JB,JA)=XC(JA,JB)
157   CONTINUE
155   CONTINUE
C     ------------------------------------------
C     WRITE Y(I) & X(I) ,RESPONSE
C     ------------------------------------------
C     WRITE(6,252)
C252  FORMAT(//5X,'_____RESPONSE_____')
C     DO 301 I=1,M
C     WRITE(6,127)YC(I)
C127  FORMAT(3X,F12.2)
C     WRITE(6,128)(XC(I,J),J=1,K1)
C28   FORMAT(2X,3(2X,F14.6))
C01   CONTINUE
C     ------------------------------------
C     SORT Y(I)& X(I) OF NONRSPONSE
C     ------------------------------------
      I2=0.
      DO 45 I=1,NN
      IF(YB(I).EQ.0) THEN
      GOTO 45
      ELSE
      I2=I2+1
      YD(I2)=YB(I)
      DO 46 J=1,K1
      XD(I2,J)=XB(I,J)
46    CONTINUE
      ENDIF
45    CONTINUE
```

```
C     ----------------------------------------
C     SAMPLING FROM NONRESPONSE WITH SIZE N2P
C     ----------------------------------------
C     NM=NN-M
      DO 47 I=1,NM
      YE(I)=YD(I)
      DO 48 J=1,K1
      XE(I,J)=XD(I,J)
48    CONTINUE
47    CONTINUE
C     WRITE(6,253)
C253  FORMAT(///5X,'_____NONRESPONSE_____')
C     DO 303 I=1,NM
C     WRITE(6,131)YD(I)
C131  FORMAT(3X,F12.2)
C     WRITE(6,132)(XD(I,J),J=1,K1)
C132  FORMAT(2X,2(2X,F14.6))
C303  CONTINUE
C     ----------------------------------------
      DO 49 J2=1,N2P
    2 CALL RANDU(IX,IY,YFL)
      IR2=INT(YFL*NM+1)
      IF(YE(IR2).GT.0.)THEN
      YF(J2)=YE(IR2)
      YE(IR2)=0.
      DO 50 J3=1,K1
      XF(J2,J3)=XE(IR2,J3)
50    CONTINUE
      ELSE
      GOTO 2
```

```
      ENDIF
49    CONTINUE
C     ----------------------------------------
C       WRITE Y(I)& X(I) AFTER SAMPLING
C       FROM NONRESPONSE
C     ----------------------------------------
C134  FORMAT(//5X,'__________SAMPLING FROM NONRESPONSE__________')
C     DO 304 I=1,N2P
C     WRITE(6,135)YF(I)
C135  FORMAT(3X,F12.2)
C     WRITE(6,136)(XF(I,J),J=1,K1)
C136  FORMAT(2X,2(2X,F14.6))
C304  CONTINUE
C     ----------------------------------------
C     WRITR Y-BAR FROM 2 METHOD
C     ----------------------------------------
      CALL STAT(YC,M,YCBRA,SUMC,SUMCC)
      CALL STAT(YF,N2P,YFBRA,SUMF,SUMFF)
      VR2=(SUMCC-SUMC**2/M)/(M-1)
      VRN2=VR2/M
      MN2P=M+N2P
      SUMC1=SUMC+SUMF
      SUMC2=SUMCC+SUMFF
      VR3=(SUMC2-SUMC1**2/MN2P)/(MN2P-1)
      VRN3=VR3/MN2P
      YBRAT=((M*YCBRA)+(YFBRA*NM))/NN
C     ----------------------------------------
C       NAOWARUT METHOD .....BEGIN
C     ----------------------------------------
      CALL NMAX(YC,RMAX,M)
```

```
      YMAX=RMAX
      CALL NMIN(YC,RMIN,M)
      YMIN=RMIN
      YSUB=YMAX-YMIN
      YINT=YSUB/3
C     WRITE(6,4200)
C200  FORMAT(//,'---YMIM----YMAX----DIFFE---INT---')
C     WRITE(6,4003)YMIN,YMAX,YSUB,YINT
C4003  FORMAT(//5X,4(2X,F14.6))
      DO 4004 I=1,M
      XXC(I) =XC(I,2)
4004  CONTINUE
      DO 4005 I=1,M
      X2C(I)=XC(I,3)
4005  CONTINUE
C     ****************************
      CALL NMAX(XXC,R1MAX,M)
      XMAX=R1MAX
      CALL NMIN(XXC,R1MIN,M)
      XMIN=R1MIN
      XSUB=R1MAX-R1MIN
      XINT=XSUB/3
      CALL NMAX(X2C,R2MAX,M)
      X2MAX=R2MAX
      CALL NMIN(X2C,R2MIN,M)
      X2MIN=R2MIN
      X2SUB=X2MAX-X2MIN
      X2INT=X2SUB/3
C     WRITE(6,4201)
C201  FORMAT(//'---- XMIN,XMAX,DIFF,INT----X2&X3------')
```

```
C     WRITE(6,4040)XMIN,XMAX,XSUB,XINT
C040  FORMAT(//7X,4(2X,F14.6))
C     WRITE(6,4006)X2MIN,X2MAX,X2SUB,X2INT
C006  FORMAT(//7X,4(2X,F14.6))
C     ****************************************
      CY1=0.
      CY2=0.
      CY3=0.
      CX111=0.
      CX112=0.
      CX113=0.
      CX211=0.
      CX212=0.
      CX213=0.
      CX121=0.
      CX122=0.
      CX123=0.
      CX221=0.
      CX222=0.
      CX223=0.
      CX131=0.
      CX132=0.
      CX133=0.
      CX231=0.
      CX232=0.
      CX233=0.
      DO 1002 I=1,2
      DO 1003 J=1,3
      DO 1004 K=1,3
       CX(I,J,K)=0
```

```
1004  CONTINUE
1003  CONTINUE
1002  CONTINUE
      DO 8888 I4=1,3
      BB1(I4)=0.
      BB2(I4)=0.
      BB3(I4)=0
8888  CONTINUE
      DO 3610 I=1,6
      VP(I)=0.
      VRN(I)=0
3610  CONTINUE
C     ****************************************
      DO 413 I=1,M
      IF(YC(I).LT.(YMIN+YINT)) THEN
      CY1=CY1+1
      YT1(CY1)=YC(I)
      DO 420 J=1,K1
      XT1(CY1,J)=XC(I,J)
      ATT1(J,CY1)=XC(I,J)
420   CONTINUE
      GOTO 413
      ELSE IF(YC(I).LT.(YMIN+(2*YINT))) THEN
      CY2=CY2+1
      YT2(CY2)=YC(I)
      DO 421 J=1,K1
      XT2(CY2,J)=XC(I,J)
      ATT2(J,CY2)=XC(I,J)
421   CONTINUE
      GOTO 413
```

```
      ELSE
      CY3=CY3+1
      YT3(CY3)=YC(I)
      DO 423 J=1,K1
      XT3(CY3,J)=XC(I,J)
      ATT3(J,CY3)=XC(I,J)
423   CONTINUE
      ENDIF
413   CONTINUE
      ICY1=CY1
      ICY2=CY2
      ICY3=CY3
      PY(1)=CY1/M
      PY(2)=CY2/M
      PY(3)=CY3/M
C     DO 716 I=1,ICY1
C     WRITE(6,717)YT1(I)
C17   FORMAT(2(5X,F12.4))
C     WRITE(6,718)(ATT1(J,I),XT1(I,J),J=1,3)
C18   FORMAT(6(5X,F12.4))
C16   CONTINUE
C     DO 756 I=1,ICY2
C     WRITE(6,757)YT2(I)
C57   FORMAT(/2(5X,F12.4))
C     WRITE(6,758)(ATT2(J,I),XT2(I,J),J=1,3)
C58   FORMAT(6(5X,F12.4))
C56   CONTINUE
C     DO 766 I=1,ICY3
C     WRITE(6,767)YT3(I)
C67   FORMAT(2(5X,F12.4))
```

```
C     WRITE(6,768)(ATT3(J,I),XT3(I,J),J=1,3)
C68   FORMAT(6(5X,F12.4))
C66   CONTINUE
C     ------------------------------------------
C     WRITE(6,4202)ICY1,ICY2,ICY3
C202  FORMAT(/3(5X,I6))
C     ------------------------------------------
      CALL STAT(YT1,ICY1,YBI1,U1,U2)
      CALL STAT(YT2,ICY2,YBI2,U3,U4)
      CALL STAT(YT3,ICY3,YBI3,U5,U6)
      CALL BETA(ICY1,K1,ATT1,YT1,BB1)
      CALL BETA(ICY2,K1,ATT2,YT2,BB2)
      CALL BETA(ICY3,K1,ATT3,YT3,BB3)
C     DO 2542 III=1,3
C     WRITE(6,2543)BB1(III),BB2(III),BB3(III)
C543  FORMAT(/3(5X,F12.4))
C542  CONTINUE
C     ------------------------------------------
      DO 8001 I=1,ICY1
      IF(XT1(I,2).LT.(XMIN+XINT))THEN
        CX111=CX111+1
        GOTO 8001
      ELSE IF(XT1(I,2).LT.(XMIN+(2*XINT)))THEN
        CX112=CX112+1
        GOTO 8001
      ELSE
        CX113=CX113+1
      ENDIF
8001  CONTINUE
      CX(1,1,1)=CX111/ICY1
```

```
      CX(1,1,2)=CX112/ICY1
      CX(1,1,3)=CX113/ICY1
      DO 8002 I=1,ICY1
      IF(XT1(I,3).LT.(X2MIN+X2INT))THEN
        CX211=CX211+1
        GOTO 8002
      ELSE IF(XT1(I,3).LT.(X2MIN+(2*X2INT)))THEN
        CX212=CX212+1
        GOTO 8002
      ELSE
        CX213=CX213+1
      ENDIF
 8002 CONTINUE
      CX(2,1,1)=CX211/ICY1
      CX(2,1,2)=CX212/ICY1
      CX(2,1,3)=CX213/ICY1
C *****************************************
      DO 8003 I=1,ICY2
      IF(XT2(I,2).LT.(XMIN+XINT))THEN
        CX121=CX121+1
        GOTO 8003
      ELSE IF(XT2(I,2).LT.(XMIN+(2*XINT)))THEN
        CX122=CX122+1
        GOTO 8003
      ELSE
        CX123=CX123+1
      ENDIF
 8003 CONTINUE
      CX(1,2,1)=CX121/ICY2
      CX(1,2,2)=CX122/ICY2
```

```
      CX(1,2,3)=CX123/ICY2
      DO 8004 I=1,ICY2
      IF(XT2(I,3).LT.(X2MIN+X2INT))THEN
        CX221=CX221+1
        GOTO 8004
      ELSE IF(XT2(I,3).LT.(X2MIN+(2*X2INT)))THEN
        CX222=CX222+1
        GOTO 8004
      ELSE
        CX223=CX223+1
      ENDIF
8004  CONTINUE
      CX(2,2,1)=CX221/ICY2
      CX(2,2,2)=CX222/ICY2
      CX(2,2,3)=CX223/ICY2
C *****************************************
      DO 8005 I=1,ICY3
      IF(XT3(I,2).LT.(XMIN+XINT))THEN
        CX131=CX131+1
        GOTO 8005
      ELSE IF(XT3(I,2).LT.(XMIN+(2*XINT)))THEN
        CX132=CX132+1
        GOTO 8005
      ELSE
        CX133=CX133+1
      ENDIF
8005  CONTINUE
      CX(1,3,1)=CX131/ICY3
      CX(1,3,2)=CX132/ICY3
      CX(1,3,3)=CX133/ICY3
```

```
      DO 8006 I=1,ICY3
      IF(XT3(I,3).LT.(X2MIN+X2INT))THEN
        CX231=CX231+1
        GOTO 8006
      ELSE IF(XT3(I,3).LT.(X2MIN+(2*X2INT)))THEN
        CX232=CX232+1
        GOTO 8006
      ELSE
        CX233=CX233+1
      ENDIF
 8006 CONTINUE
      CX(2,3,1)=CX231/ICY3
      CX(2,3,2)=CX232/ICY3
      CX(2,3,3)=CX233/ICY3
C     ------------------------------------------------
C      WRITE(6,4204)
C204  FORMAT(/,'-----POBABILITY TABLE & VALUE EXPERIMENT----')
C     WRITE(6,4114)(((CX(I,J,K),J=1,3),K=1,3),I=1,2)
C114  FORMAT(//,3(5X,F8.6))
C     ------------------------------------------------
      DO 4117 I=1,NM
      XAT1=XD(I,2)
      XAT2=XD(I,3)
      CALL SEARP(XAT1,XMIN,XINT,CX,TB4)
      CALL SEARPP(XAT2,X2MIN,X2INT,CX,TB5)
      DO 4118 J=1,3
      PP(J)=TB4(J)*TB5(J)*PY(J)
 4118 CONTINUE
      PP1=(PP(1)+PP(2)+PP(3))
      IF(PP1.EQ.0.)THEN
```

```
      NTS=NTS+1
      GOTO 8899
      ENDIF
      PP11=PP(1)/PP1
      PP12=PP(2)/PP1
      PP13=PP(3)/PP1
      PMAX=MAX(PP11,PP12,PP13)
      IF(PMAX.EQ.PP11)THEN
      YN1(I)=BB1(1)+BB1(2)*XAT1+BB1(3)*XAT2
      YN2(I)=YBI1
      ELSE IF(PMAX.EQ.PP12)THEN
      YN1(I)=BB2(1)+BB2(2)*XAT1+BB2(3)*XAT2
      YN2(I)=YBI2
      ELSE
      YN1(I)=BB3(1)+BB3(2)*XAT1+BB3(3)*XAT2
      YN2(I)=YBI3
      ENDIF
      XAT1=0.
      XAT2=0.
4117  CONTINUE
C     WRITE(6,4220)
C4220 FORMAT('___Y  FROM  CALCULAT FOR Y NONRESPONS ___')
C     WRITE(6,4221)(YN1(I),I=1,NM)
C4221 FORMAT(//,5(5X,F16.6))
C     WRITE(6,4210)
C     ==========================================================
C4210 FORMAT(///,'_______CALCULATE Y-BRA BY N-METHOD_________')
      NNP=NM
      CALL STAT(YN1,NNP,YDBRA1,SUMN1,SUMNN1)
      CALL STAT(YN2,NNP,YDBRA2,SUMN2,SUMNN2)
```

```
      YNBRA1=((YCBRA*M)+(YDBRA1*NNP))/NN
      YNBRA2=((YCBRA*M)+(YDBRA2*NNP))/NN
      SMN=SUMC+SUMN1
      SMNN=SUMCC+SUMNN1
      SMN1=SUMC+SUMN2
      SMN2=SUMCC+SUMNN2
      VR4=(SMNN-SMN**2/NN)/(NN-1)
      VRN4=VR4/NN
      VR5=(SMN2-SMN1**2/NN)/(NN-1)
      VRN5=VR5/NN
C     *-----------------------------------------*
C     *          PHILLIP S.KOTT                 *
C     *-----------------------------------------*
      CALL STAT(YC,M,YYPP,U7,U8)
      RM=M
      CR=RM/NN
      CR1=1-CR
      CR2=SQRT(CR1)
      DO 151 J1=1,M
      YK(J1)=CR2*YK(J1)
      DO 153 J2=1,K1
      XK(J2,J1)=CR2*XK(J2,J1)
153   CONTINUE
151   CONTINUE
      CALL BETA(M,K1,XK,YK,TB6)
      DO 159 LA=1,NM
      YN3(LA)=TB6(1)+TB6(2)*XE(LA,2)+TB6(3)*XE(LA,3)
159   CONTINUE
      CALL STAT(YN3,NM,YPB,SUMP,SUMPP)
      TYP=YPB
```

```
      YPBRA=(YYPP*M+TYP*NM)/NN
C     _____END PHILLIP_____
      SMP=SUMC+SUMP
      SMPP=SUMCC+SUMPP
      VR6=(SMPP-SMP**2/NN)/(NN-1)
      VRN6=VR6/NN
      YBRA1=YBRA1+YBBRA
      YBRA2=YBRA2+YCBRA
      YBRA3=YBRA3+YFBRA
      YBRA4=YBRA4+YBRAT
      YBRA5=YBRA5+YNBRA1
      YBRA6=YBRA6+YNBRA2
      YBRA7=YBRA7+YPBRA
      TS1=TS1+YBBRA**2
      TS2=TS2+YCBRA**2
      TS3=TS3+YBRAT**2
      TS4=TS4+YNBRA1**2
      TS5=TS5+YNBRA2**2
      TS6=TS6+YPBRA**2
      EE1=(YBBRA-YBBRA)/YBBRA
      EE2=(YBBRA-YCBRA)/YBBRA
      EE4=(YBBRA-YBRAT)/YBBRA
      EE5=(YBBRA-YNBRA1)/YBBRA
      EE6=(YBBRA-YNBRA2)/YBBRA
      EE7=(YBBRA-YPBRA)/YBBRA
C     *_____
      EB1=ABS(EE1)
      EB2=ABS(EE2)
      EB4=ABS(EE4)
      EB5=ABS(EE5)
```

```
      EB6=ABS(EE6)
      EB7=ABS(EE7)
C     *-----------------------------
      PPE1=EB1*100
      PPE2=EB2*100
      PPE4=EB4*100
      PPE5=EB5*100
      PPE6=EB6*100
      PPE7=EB7*100
C     ----------------------
      APE1=APE1+PPE1
      APE2=APE2+PPE2
      APE4=APE4+PPE4
      APE5=APE5+PPE5
      APE6=APE6+PPE6
      APE7=APE7+PPE7
8899  CONTINUE
      WRITE(6,1968)NTS
1968  FORMAT(3X,'NTS=',I6)
C     *---------------------------------*
C     *_______CALCULATE PERCEN%_____________*
C     *       YYB1=SAMPLE MEAN          *
C     *       YYB2=RESPONSE MEAN        *
C     *       YYB4=HANSEN&HURWITZ       *
C     *       YYB5=NAOWARUT-REG         *
C     *       YYB6=NAOWARUT=MEAN        *
C     *       YYB7=PHILLIP S.KOTT       *
C     *-----------------------------------------*
      YYB1=YBRA1/TS
      YYB2=YBRA2/TS
```

```
      YYB3=YBRA3/TS
      YYB4=YBRA4/TS
      YYB5=YBRA5/TS
      YYB6=YBRA6/TS
      YYB7=YBRA7/TS
      SD21=(TS1-YBRA1**2/TS)/(TS-1)
      SD22=(TS2-YBRA2**2/TS)/(TS-1)
      SD23=(TS3-YBRA4**2/TS)/(TS-1)
      SD24=(TS4-YBRA5**2/TS)/(TS-1)
      SD25=(TS5-YBRA6**2/TS)/(TS-1)
      SD26=(TS6-YBRA7**2/TS)/(TS-1)
      PE1=APE1/TS
      PE2=APE2/TS
      PE4=APE4/TS
      PE5=APE5/TS
      PE6=APE6/TS
      PE7=APE7/TS
C     *--------------------------------------*
C     *            REPORT                    *
C     *--------------------------------------*
      WRITE(6,*)'-----------------------------------------------
     *----------'
      WRITE(6,141)
141   FORMAT(28X,'  MEAN  ',7X,'PERCEN      VARIANCE')
      WRITE(6,*)'-----------------------------------------------
     *----------'
      WRITE(6,142)YYB1,PE1,SD21,YYB2,PE2,SD22,YYB4,PE4,SD23,
     *YYB5,PE5,SD24,YYB6,PE6,SD25,
     *YYB7,PE7,SD26
142   FORMAT(/3X,'SAMPLE MEAN      ',F16.4,4X,F11.8,4X,F10.6,
```

```
     *      /3X,'RESPONSE MEAN      ',F16.4,4X,F11.8,4X,F10.6,
     *      /3X,'HANSEN & HURWITZ   ',F16.4,4X,F11.8,4X,F10.6,
     *      /3X,'NAOWARUT-REG       ',F16.4,4X,F11.8,4X,F10.6,
     *      /3X,'NAOWARUT-MEAN      ',F16.4,4X,F11.8,4X,F10.6,
     *      /3X,'PHILLIP S.KOTT     ',F16.4,4X,F11.8,4X,F10.6/)
      WRITE(6,*)'----------------------------------------------------
     *----------'
1111  CONTINUE
      STOP
      END
C     ------------------------------
      SUBROUTINE NORMAL(MEAN,SIGMA,ZZ)
      REAL MEAN
      COMMON IX,L1
      PI=3.1459
      IF(L1.EQ.1)GOTO 10
      CALL RANDU(IX,IYY,YYFL)
      RONE=YYFL
      CALL RANDU(IX,IYY,YYFL)
      RTWO=YYFL
      ZONE=SQRT(-2*ALOG(RONE))*COS(2*PI*RTWO)
      ZTWO=SQRT(-2*ALOG(RONE))*SIN(2*PI*RTWO)
      ZZ=ZONE*SIGMA+MEAN
      L1=1
      RETURN
10    ZZ=ZTWO*SIGMA+MEAN
      L1=0
      RETURN
7     END
C     **********************
```

```
      SUBROUTINE RANDU(IXX,IYY,YFL)
      IYY=IXX*65539
      IF (IYY) 5,6,6
5     IYY=IYY+2147483647+1
6     YFL=IYY
      YFL=YFL*.4556613E-09
      IXX=IYY
      RETURN
      END
C     ***************
      SUBROUTINE STAT(R,MM,YBRA,SUM,SSUM)
      DIMENSION R(MM)
      DOUBLE PRECISION  SUM,SSUM
      SSUM=0
      SUM=0.
      DO 305 I=1,MM
      SUM=SUM+R(I)
      SSUM=SSUM+R(I)*R(I)
305   CONTINUE
      YBRA=(SUM/MM)
      RETURN
      END
      SUBROUTINE NMAX(RN,RMAX,NA)
      DIMENSION  RN(NA)
      RMAX=0.
      DO 4001 I=1,NA
      IF(RN(I).GT.RMAX)THEN
      RMAX= RN(I)
      ELSE
      RMAX=RMAX
```

```
      ENDIF
4001  CONTINUE
      RETURN
      END
      SUBROUTINE NMIN(RN,RMIN,NA)
      DIMENSION  RN(NA)
      RMIN=RN(1)
      DO 4002 I=2,NA
      IF(RN(I).LT.RMIN)THEN
      RMIN= RN(I)
      ELSE
      RMIN=RMIN
      ENDIF
4002  CONTINUE
      RETURN
      END
C     ***********************************************
      SUBROUTINE SEARP(XZ,PMIN,PINT,XXZ,TB)
      DIMENSION XXZ(2,3,3),TB(3)
      DO 600 I=1,3
        TB(I)=0
600   CONTINUE
      IF(XZ.LT.(PMIN+PINT))THEN
      DO 601 J=1,3
        TB(J)=XXZ(1,J,1)
601   CONTINUE
      ELSE IF(XZ.LT.(PMIN+(2*PINT)))THEN
      DO 602 J=1,3
        TB(J)=XXZ(1,J,2)
602   CONTINUE
```

```
      ELSE
      DO 603 J=1,3
        TB(J)=XXZ(1,J,3)
603   CONTINUE
      ENDIF
      RETURN
      END
C     ***********************************************
      SUBROUTINE SEARPP(XZ,PPMIN,PPINT,XZZ,TB2)
      DIMENSION XZZ(2,3,3),TB2(3)
      DO 604 I=1,3
        TB2(I)=0
604   CONTINUE
      IF(XZ.LT.(PPMIN+PPINT))THEN
      DO 605 J=1,3
        TB2(J)=XZZ(2,J,1)
605   CONTINUE
      ELSE IF(XZ.LT.(PPMIN+(2*PPINT)))THEN
      DO 606 J=1,3
        TB2(J)=XZZ(2,J,2)
606   CONTINUE
      ELSE
      DO 607 J=1,3
        TB2(J)=XZZ(2,J,3)
607   CONTINUE
      ENDIF
      RETURN
      END
C     ----------------------------------------
C          SUBROUTINE RGRESSSION
```

```
C  ------------------------------------------------
      SUBROUTINE BETA(N,K1,SXT,SY,SB)
      DIMENSION SX(380,3),SY(380),SB(3),SXT(3,380),SXTY(3)
      DOUBLE PRECISION A(3,3),S(3,3),SUM,SIK
      DO 20 I=1,N
      DO 25 J=1,K1
      SX(I,J)=SXT(J,I)
25    CONTINUE
20    CONTINUE
      DO 30 I=1,K1
      SUM=0.0
      DO 35 J=1,N
      SUM=SUM+(SXT(I,J)*SY(J))
35    CONTINUE
      SXTY(I)=SUM
30    CONTINUE
      DO 36 I=1,K1
      DO 40 L=1,K1
      SIK=0.0
      DO 45 J=1,N
      SIK=SIK+(SXT(I,J)*SX(J,L))
45    CONTINUE
      S(I,L)=SIK
40    CONTINUE
36    CONTINUE
      DO 58 I=1,K1
      DO 50 J=1,K1
50    A(I,J)=S(I,J)
58    CONTINUE
      CALL INVS(K1,A)
```

```
      DO 60 I=1,K1
      SB(I)=0.0
      DO 60 J=1,K1
60    SB(I)=SB(I)+(A(I,J)*SXTY(J))
      RETURN
      END
C     ------------------------------------
      SUBROUTINE INVS(K1,A)
C     DIMENSION A(3,3)
      DOUBLE PRECISION A(3,3)
      DO 20 L=1,K1
      IF(A(L,L))56,20,56
56    A(L,L)=-1./A(L,L)
      DO 5 I=1,K1
      IF(I-L) 3,5,3
3     A(I,L)=-A(I,L)*A(L,L)
5     CONTINUE
      DO 10 I=1,K1
      DO 10 J=1,K1
      IF((I-L)*(J-L)) 9,10,9
9     A(I,J)=A(I,J)-(A(I,L)*A(L,J))
10    CONTINUE
      DO 20 J=1,K1
      IF(J-L)18,20,18
18    A(L,J)=-A(L,J)*A(L,L)
20    CONTINUE
      DO 25 I=1,K1
      DO 25 J=1,K1
25    A(I,J)=-A(I,J)
      RETURN
```

```
      END
/*
// EXEC LNKEDT,SIZE=512K
// ASSGN SYS006,00E
// EXEC
00000100
15004500
10009502
10009004
10008008
10006016
20019004
20018008
20016016
20012032
30028506
30027012
30024024
30018048
40038008
40036016
40032032
40024064
/*
/&
* $$ EOJ
```

ข้อมูลตัวอย่าง

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043000561530004

008000484570002

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043000421535002

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126500404065007

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168000403090001

041200483099901

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042400560524001

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044000700030002

166150166076001

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073000480545004

044500560050004

072700483030000

126700402020002

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061500700035001

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134745251530002

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164950250541003

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042100561545003

001500481045006

003000561545002

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061800563040003

165000560050002

061800480524002

041500562030001

041800493030002

045000700050002

042000561020000

074500720045003

042000560223001

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040800300040001

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ประวัติผู้เขียน

นางสาวเนาวรัตน์ มีจันทร์ สำเร็จการศึกษาปริญญาวิทยาศาสตรบัณฑิต สาขาสถิติจากคณะวิทยาศาสตร์ มหาวิทยาลัยศิลปากร ในปีการศึกษา 2535 และเข้าศึกษาต่อในหลักสูตรปริญญาสถิติศาสตรมหาบัณฑิต ภาควิชาสถิติ คณะพาณิชยศาสตร์และการบัญชี จุฬาลงกรณ์มหาวิทยาลัย ในปีการศึกษา 2536 โดยได้รับทุนการศึกษาในโครงการผลิตและพัฒนาอาจารย์ จากทบวงมหาวิทยาลัย