

APPENDIX - III
#####

C-PROGRAM FOR SECTION [4.4]

SIMULATION STUDY OF STEIN'S AND ITS MODIFIED PROCEDURE

```
#include <stdio.h>
#include <math.h>
#include <stdlib.h>
#include <conio.h>
#include <ctype.h>
#include <time.h>
#define DASH
"
void main()
{
    float ss=0.0,s=0.0,w1,w2,y1,c1,z1,FILE *fp,
    float v1,w,x,y,sd,los,d,v,a,t,m,ms,cm,cs,css,cms,e,f,g2=0.00000,
    float h,z,r1,r2,r3,l1,l2;
    float u1,u2,u3,u4;
    int i=1,j=1,k=1,c,o,g,rp=0,s1=0,b,g1,ms1=0,mp=0;
    float mm,me,mf,mh,p;
    char opr;
    clrscr();
    printf("\n Enter the set of values to implement Stein's Procedure");
    printf("\n Mean of N.D.= ");
    scanf("%f",&a);
    printf("\n Variance of N.D.= ");
    scanf("%f",&v1);
    printf("\n The L.O.S.= ");
    scanf("%f",&los);
    printf("\n Tab S.N.V. Value with f l.o.s.=",los/2.0);
    scanf("%f",&z1);
    printf("\n The width of C.I.= ");
    scanf("%f",&d);
    c1=v1*z1*z1/(d*d);
    fp=fopen("e.txt","w+");
    fprintf(fp,"\n\t\t\t SIMULATION STUDY OF STEIN'S AND IT'S MODIFIED
    PROCEDURE");
    fprintf(fp,"*****");
    fprintf(fp," \n\t\t MEAN =%f VAR.=%f L.O.S.=%f",a,v1,los);
    fprintf(fp," \n\t\t WIDTH OF C.I.=%f THEO.COVERAGE =%f FIXED SAMPLE-SIZE
    =%f", d,1.0-los,c1);
    fprintf(fp," \n\t NO. OF C.I. SIMULATED = 1000");
    fprintf(fp," \n\n\t\t",DASH);
    fprintf(fp," \n\t\t SIMULATED \t STEIN'S \t MODIFIED \t STEIN'S \t
    MODIFIED \t PENALTY");
    fprintf(fp," \n\t\t SIZE OF \t COVERAGE \t COVERAGE \t E(N) \t E(N) \t FOR");
}
```

```

fprintf(fp,"\\n\\t FIRST-SAMPLE\\t      (% ) \\t      (% ) \\t      \\\t
        \\t      UNKNOWNNESS");
fprintf(fp,"\\n\\t%s",DASH);

do {
    printf("\\n Enter the size of FIRST-SAMPLE for Simulation Study :- ");
    scanf("%d",&c);
    printf("\\n Enter Tab. t-value at specified if l.o.s & %d d.f =
           ",los/2.0,c-1);
    scanf("%f",&t);
    sd=sqrt(v1);
    randomize();
    do
    {
        g1=c/2;
        do
        {
            w=(float) random(32000)/32000;
            v=(float) random(32000)/32000;
            if (w==g2 && v==g2)
                { g1+=1;break; }
            x=sqrt(-2.0*log(w))*cos(2.0*3.1428*v)*sd+a;
            y=sqrt(-2.0*log(w))*sin(2.0*3.1428*v)*sd+a;
            s+=x+y;
            ss+=x*x+y*y;
            j++;
        }while(j<=g1);
        if (c!=2*g1)
        { w1=(float) random(32000)/32000;
          w2=(float) random(32000)/32000;
          y1=sqrt(-2.0*log(w1))*cos(2.0*3.1428*w2)*sd+a;
          s+=y1;
          ss+=y1*y1;
        }
        m=s/(float) c;
        ms=(ss-(float)c*m*m)/(float) (c-1);
        o=(int) (ms*t*t/(d*d))+1;
        if (o<c)
        {
/* STEIN'S FIRST-STAGE PROCEDURE */
            e=m-1.0;
            f=m+1.0;
            if ( e<0.0 && f>0.0)
                { rp+=1,mp+=1; }
        }
        else
        {
/* STEIN'S SECOND-STAGE AND ITS MODIFIED VERSION */
            g=o-c;s1+=g;b=(o-c)/2;ms1+=g-1;
            do
            {
                w=(float) random(32000)/32000;
                v=(float) random(32000)/32000;
                if (w==g2 && v==g2)
                    { b+=1;break; }
            }
        }
    }
}

```

```

x=sqrt(-2.0*log(w))*cos(2.0*3.1428*v)*sd+a;
y=sqrt(-2.0*log(w))*sin(2.0*3.1428*v)*sd+a;
cs=s+x+y;
css=ss+x*x+y*y;
k++;
}while(k<=b);
if (g==1)
  cs=cs-y;
else
{
  if ( g!=2*b)
  {
    w1=(float) random(32000)/32000,
    w2=(float) random(32000)/32000,
    y1=sqrt(-2.0*log(w1))*cos(2.0*3.1428*w2)*sd+a;
    cs=cs+y1;
    css=css+y1*y1;
  }
}
cm=cs/(float) (c+g),mm=(cs-y)/(float) (c+g-1),
cms=(css-cm*cm*(float) (c+g))/(float) (c+g-1);
e=cm-1.0,me=mm-1.0,
f=cm+1.0,mf=mm+1.0,
if (e<0.0 && f>0.0)
rp+=1,
if (me<0.0 && mf>0.0)
mp+=1;
}
i++;
s=0.0,ss=0.0,j=1,k=1;
}while(i<=1000),
h=(s1/1000.0)+(float) c,mh=(ms1/1000.0)+(float) c,p=(h-c1)/sd,
fprintf(fp,"n\n\t %d \t %f \t %f \t %f \t %f \t %f \t %f",
",c, rp/1000.0, mp/1000.0, h, mh, p),
i=1, rp=0, mp=0, s1=0, ms1=0,
getch(),
clrscr(),
fflush(stdin),
printf("\n\n\n Do you want to continue SIMULATION STUDY.If yes , type y :- ");
scanf("%c",&opr),
while(opr == 'y' ),
fprintf(fp,"n\t%s",DASH);
fclose(fp);

}
/* PROGRAM END */

```