

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\t SIMULATION STUDY OF STEIN'S AND IT'S MODIFIED
        PROCEDURE");
    fprintf(fp,"\n\t\t\t\t *****");
    fprintf(fp,"\n\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\t NO. OF C.I. SIMULATED = 1000");
    fprintf(fp,"\n\n\t\t%s",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 \tCOVERAGE \t E(N) \t E(N) \tFOR");
}
```

```

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 %f 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;sl+=g;b=(o-c)/2;msl+=g-1;
                do
                {
                    w=(float) random(32000)/32000;
                    v=(float) random(32000)/32000;
                    if (w==g2 && v==g2)
                        { b+=1;break;}
                }
            }
    }
}

```

