

## APPENDIX 1

### A -1.1. Program for generation from $N(0, 1)$ by using CLT –

```
/*program for normal generation from clt*/
#include<stdio.h>
#include<math.h>
#include<time.h>
#include<conio.h>
#include<stdlib.h>
void main()
{
    int i, j, k, n1, n2;
    float u, z, x, s, sq, m, v, y;
    FILE *fp;
    fp=fopen("clt.xls","w");
    clrscr();
    printf("enter number of obs. and Uniform sample size");
    scanf("%d %d", &n1, &n2);
    randomize();
    s=0, sq=0;
    for(i=1;i<=n1;i++)
    {
        y=0;
        for(j=1;j<=n2;j++)
        {
            u=(float)random(RAND_MAX)/RAND_MAX;
            y=y+u;
        }
        z=(y-n2/2)/sqrt(n2/12);
        fprintf(fp,"\n %f", z);
        s=s+z;
        sq=sq+(z*z);
    }
    m=s/n1; v=(sq/n1)-(m*m);
    printf(" Mean = %f", m);
    printf(" Variance = %f", v);
    fclose(fp);
    getch();
}
```

### A-1.2. Program for generation from $N(0, 1)$ by using Box – Muller Method -

```
/*program for normal generation from Box- Muller Method*/
#include<stdio.h>
#include<math.h>
#include<time.h>
#include<conio.h>
#include<stdlib.h>
void main()
{
    int i, n;
    float u1, u2, z1, z2, t, s, sq, m, v;
    FILE *fp;
    fp=fopen("box.xls","w");
    clrscr();
    printf("enter the value number of observations");
    scanf("%d",&n);
    randomize();
    t=n/2;
    for(i=1;i<=t;i++)
    {
        u1=(float)random(RAND_MAX)/RAND_MAX;
        u2=(float)random(RAND_MAX)/RAND_MAX;
        z1=sqrt(-2*log(u1))*sin(360*u2);
        z2=sqrt(-2*log(u1))*cos(360*u2);
        fprintf(fp,"\n %f", z1);
        fprintf(fp,"\n %f", z2);
        s=s+z1+z2;
        sq=sq+z1*z1+z2*z2;
    }
    m=s/n;
    v=(sq/n)-(m*m);
    printf(" Mean = %f", m);
    printf(" Variance = %f", v);
    fclose(fp);
    getch();
}
```

### A 1.3. Program for generation from $N(0, 1)$ by using Accept – Reject Method –

```
/*program for normal generation from a cauchy distribution*/
#include<stdio.h>
#include<math.h>
#include<time.h>
#include<conio.h>
#include<stdlib.h>
void main()
{
    int i, j, k, n;
    float s, sq;
    float u1, u2, z1, z2, x, g, y, m, v;
    FILE *fp;
    fp=fopen("accept1.xls","w");
    clrscr();
    printf("enter the value number of observations");
    scanf("%d",&n);
    randomize();
    k=0; s=0, sq=0;
    for(i=1;i<15000;i++)
    {
        u1=(float)random(RAND_MAX)/RAND_MAX;
        u2=(float)random(RAND_MAX)/RAND_MAX;
        x=tan(360*(u1-1/2));
        g=sqrt(3.141593/2)*(1+x*x)*exp((-x*x)/2)*(1/1.520347);
        if (u2<=g)
        {
            k=k+1;
            y=x;
            s=s+y;
            sq=sq+(y*y);
            fprintf(fp,"\n %f", y);
        }
    }
    if (k>n-1)
    break;
}
m=s/k;
```

```
v=(sq/k)-(m*m);  
printf("K = %d", k);  
printf("Mean = %f", m);  
printf("Variance = %f", v);  
fclose(fp);  
getch();  
}
```