**6: Implementation of Chi-Square test for checking Uniformity Property of random numbers.**

**ChiTest.java**

import java.util.\*;

class ChiTest

{

public static void main(String args[])

{

Scanner sc = new Scanner(System.in);

int i;

double[] x = new double[6];

x[0] = 0.05;

double a;

Random rd=new Random();

//int i,j;

double rand[]=new double[100];

//Scanner sc=new Scanner(System.in);

System.out.print("Enter alpha:");

double alpha=sc.nextDouble();

double xalpha=0;

if(alpha==0.005)

xalpha=23.6;

else if(alpha==0.01)

xalpha=21.7;

else if(alpha==0.025)

xalpha=19.0;

else if(alpha==0.05)

xalpha=16.9;

else if(alpha==0.01)

xalpha=14.7;

else

{

System.out.println("Invalid alpha");

System.exit(0);

}

for(i=0;i<100;i++)

rand[i]=rd.nextInt(100)\*1.0/100;

/\*

int a1=7;

int c=5;

int m=12;

int n=100;

rand[0]=0.5;

for(i=1;i<n;i++)

{

rand[i]=((a1\*rand[i-1]+c)%m)/m;

rand[i]=(double)Math.floor(rand[i]\*100)/100;

System.out.print(" "+rand[i]);

}

\*/

int freq[]=new int[10];

for(i=0;i<10;i++)

freq[i]=0;

for(i=0;i<100;i++)

{

a=rand[i];

if(a<=0.1)

freq[0]++;

else if(a<=0.2)

freq[1]++;

else if(a<=0.3)

freq[2]++;

else if(a<=0.4)

freq[3]++;

else if(a<=0.5)

freq[4]++;

else if(a<=0.6)

freq[5]++;

else if(a<=0.7)

freq[6]++;

else if(a<=0.8)

freq[7]++;

else if(a<=0.9)

freq[8]++;

else

freq[9]++;

}

int ei=10;

double x1=0;

System.out.prbintln("\nClass\tFrequency\tx");

for(i=0;i<10;i++)

{

System.out.println(i+1+"\t"+freq[i]+"\t\t"+Math.pow(freq[i]-ei,2)/ei);

x1+=Math.pow(freq[i]-ei,2)/ei;

}

System.out.println("X0\_alpha="+xalpha);

System.out.println("X0="+x1);

if(xalpha>x1)

System.out.println("Uniformly Distributed.");

else

System.out.println("Not Uniformly Distributed.");

}

}

**Output**

