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1 !Assignment 2
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5 program LCG
6   implicit none
7   integer :: a, c, m, x_0, x_n
8   integer:: n, i, nbin, f(1000), i_bin, E
9   real :: x, x_max, binSize, chisq
10  open(unit=1,file="lcgout.dat")
11  open(unit=2,file="lcgdist.dat")
12  a = 106
13  c = 1283
14  m = 100001
15  n = 1E4
16  x_0 = 0
17  x_n = x_0
18  x_max = 1.0
19  nbin = 100
20  f = 0.0
21  E = n/nbin
22  chisq = 0.0
23  binSize = x_max/nbin
24  do i = 1, n
25    x_n = mod(a*x_n+c,m)
26    x = x_n/(1.0*m)
27    write(1,*) x
28    i_bin = int(x/binSize)+1
29    f(i_bin) = f(i_bin)+1
30  end do
31  do i = 1, nbin
32    write(2,100) (i-0.5)*binSize, f(i), f(i)/(1.0*n) !x, frequency, probability
33    chisq = chisq+(f(i)-E)**2
34    chisq = chisq/E
35  end do
36  write(*,*) "Chi^2 = ", chisq
37 100 format(F8.4,4X,I4,4X,F8.6)
38 end program LCG
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