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1 !Assignment 1
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5 program RNGDIST
6     implicit none
7     integer :: i, n, nbin, i_bin, f(100), io
8     real :: x, x_max, binSize, sum, sumSq, mean, meanSq, variance
9     open(unit=1,file="x.dat")
10    open(unit=2,file="dist.dat")
11    write(*,*) "Enter max value of x(x_max) and number of bins(nbin)"
12    read(*,*) x_max, nbin
13    f = 0.0
14    n = 0
15    sum = 0.0
16    sumSq = 0.0
17    binSize = x_max/nbin
18    do
19        read(1,*,iostat=io) x
20        if(io < 0) exit
21        if(io > 0) then
22            write(*,*) "Error in input"
23            exit
24        end if
25        n = n+1
26        i_bin = int(x/binSize)+1
27        f(i_bin) = f(i_bin)+1
28        sum = sum+x
29        sumSq = sumSq+x**2
30    end do
31    do i = 1, nbin
32        write(2,100) i-binSize*0.5, f(i), f(i)/(n*binSize) !x, f(x), rho(x)
33    end do
34    mean = sum/n
35    meanSq = sumSq/n
36    variance = meanSq-mean**2
37    write(*,110) "Mean", mean, "Variance", variance, "Standard deviation",
    sqrt(variance)
38 100 format(F6.2,4X,I0,4X,F8.6)
39 110 format(3(/A,' = ',F10.6))
40 end program RNGDIST
```