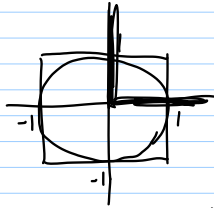


# Monte Carlo Simulation

calc of  $\pi$



hits = 0

for  $i = 1$  to # darts

$x = U(0, 1)$

$y = U(0, 1)$

if  $x^2 + y^2 \leq 1$

hits++

end  
return hits

embarrassingly  
parallel

random numbers

pseudo-random

linear congruential alg.

$a, c, m$  constants

$$X_{n+1} = (aX_n + c) \bmod m \quad (1)$$

$X_0$  is seed

use  $X_n$  to determine  $X_{n+k}$

$$X_{n+k} = (AX_n + C) \bmod m \quad (2)$$

when

$$A = a^k$$

$$C = c \left( \frac{a^k - 1}{a - 1} \right)$$

use (1) to seed  $k$  processes  
 use (2) to stride through seq.

