LAB 2B: MONTE CARLO ESTIMATION OF PI

(1) ssh to YOURACCOUNT@lab.notbc.org and log in

(2) Change directory to **private/labs**; make a directory called lab2b and go into it

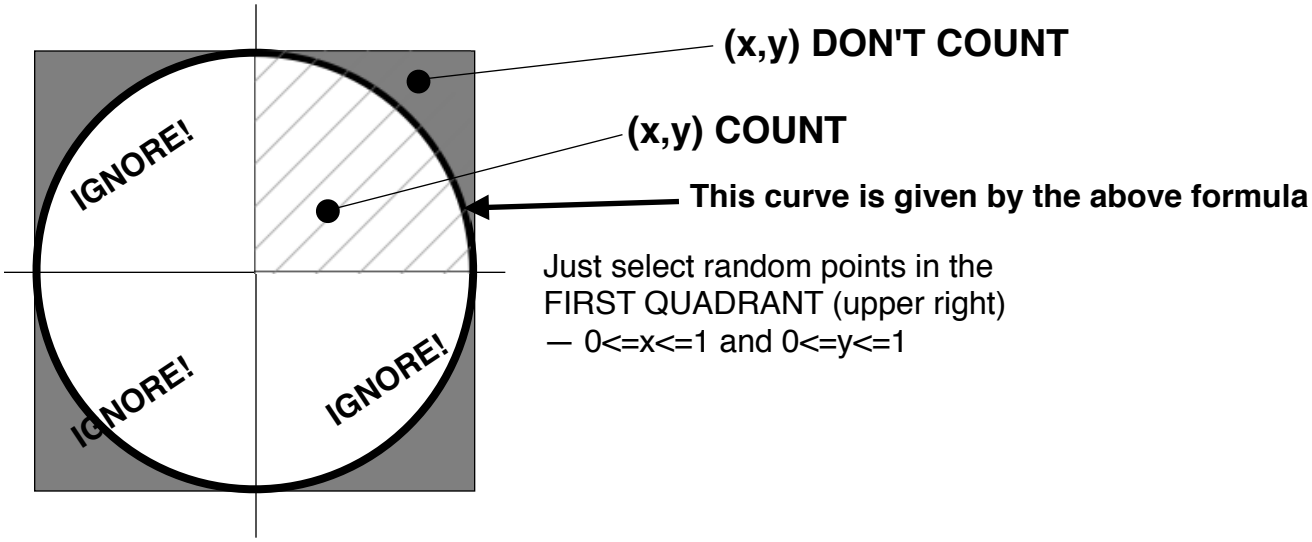
(3) There, write a program, **pi.cpp**, that has zero or one command-line arguments. The command line argument, if present, is an integer that determines how many random two-dimensional points in the first quadrant the program generates. (If not present, then the number of points is 100.) The program generates random 2-D points (x,y) in the first quadrant: that is both *x* and *y* are between 0 and 1. The program counts how many points are below the curve

$$y = (1-x^2)^{1/2}$$

The program computes and prints an estimate of π as follows:

$$\pi = 4 \text{ (fraction of points below the curve)}$$

It then prints the number of seconds the calculation took.



Area of circle = πr^2

r=1, so

Area of circle = π

Area of quarter is π/4

Area of upper right square is 1

Fraction of (striped) area of quarter in upper right square is (π/4)/1 or π/4

So… π = 4(fraction of area of quarter in upper right square)

PLAN: estimate area by random points and multiply by 4.