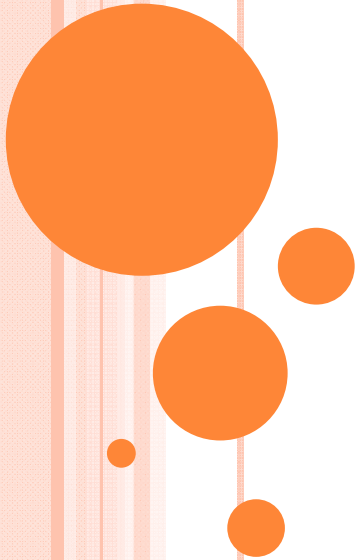


Summer Session I 2014
EECS 10 Week4 Discussion2

Che-Wei Chang

ASSIGNMENT 4

- Calculator
  - Deadline : 07/21/2014
- Name your files calculator.c, calculator.txt, and calculator.script
- Make sure your program is free of warning
  - Use –Wall option to show all warnings.
- Hints
  - Before you implement your work, review lecture slides about function declaration, function definition, and function call.
  - Read the assignment handout carefully
- Menu driven calculator for floating point number
  - Expend the functionality of the current calculator
  - SquareRoot(20pts), NthRoot, Pi(20pts), Cosine(10pts)
  - Use cos() function from math.h

Menu Driven Calculator

- Prompt a menu and user can choose the operation
- Operation List
  - 1. Add
  - 2. Subtract
  - 3. Multiply
  - 4. Divide
  - 5. Absolute
  - 6. Square Root
  - 7. Pi
  - 8. cosine
  - 9. N-th root (Bonus)
  - 10. Quit

Part 1

Part 2

Approximation of Pi

- Monte Carlo approximation of Pi

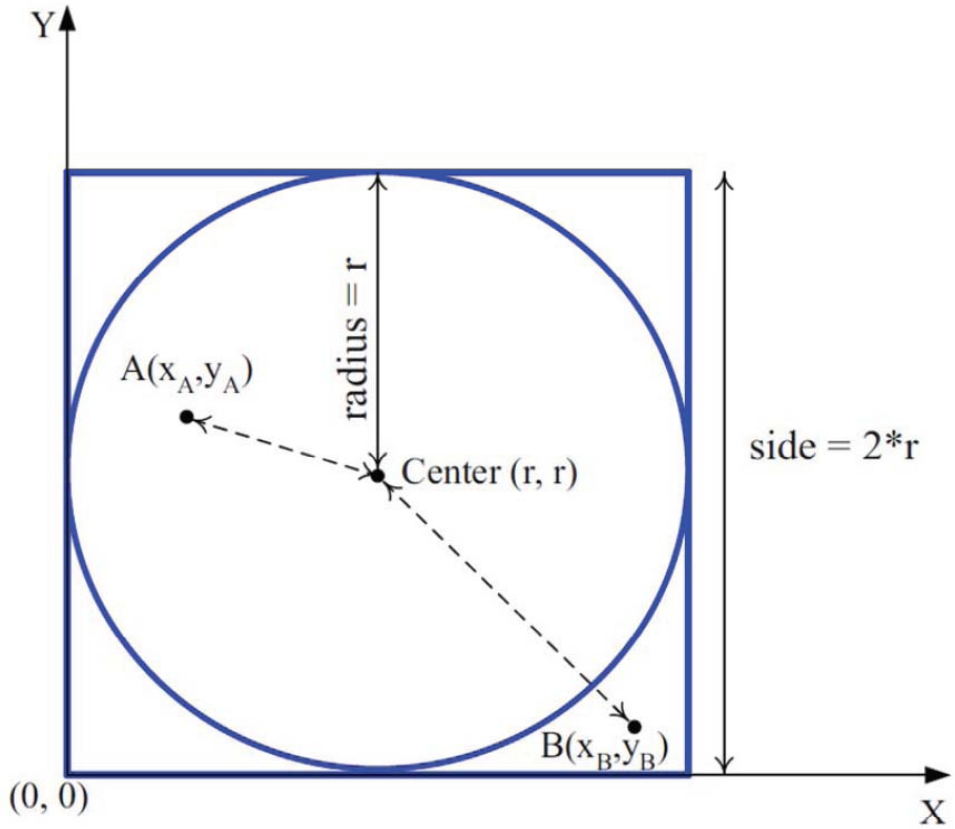


Figure 1: A Circle Circumscribed by a Square

Approximation of Pi

- Monte Carlo approximation of Pi

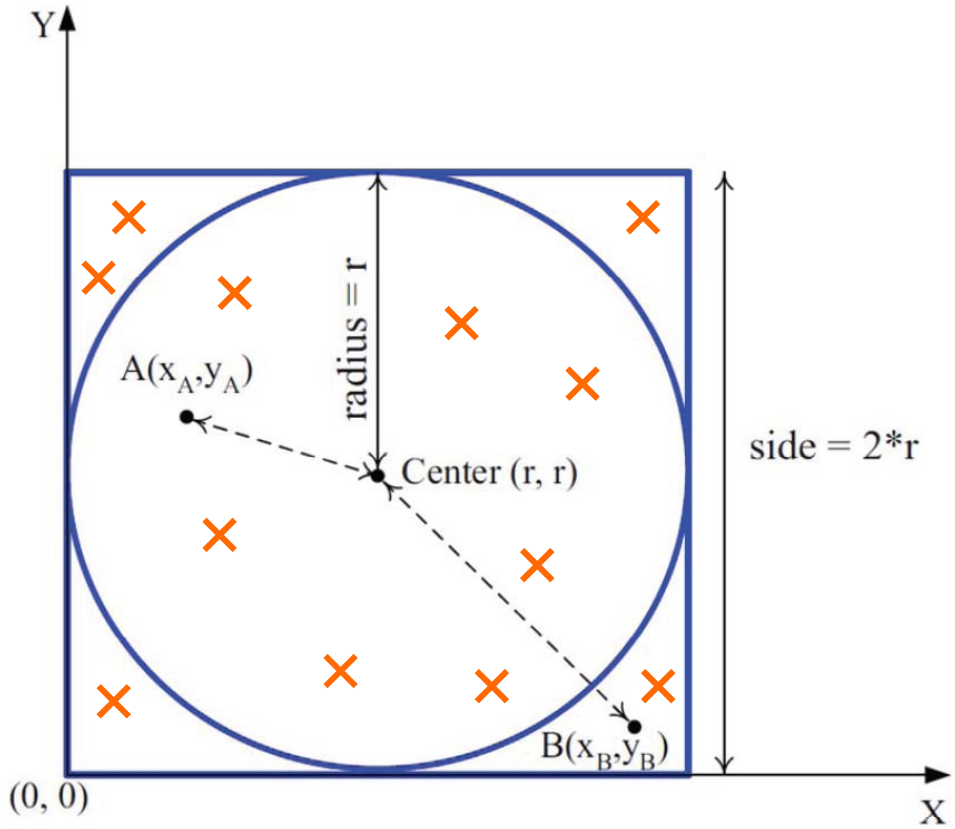


Figure 1: A Circle Circumscribed by a Square

Approximation of Pi

- Monte Carlo approximation of Pi
  - Number of points hitting circle is proportional to the area of the circle. The same for the square.

$$\frac{number\ of\ points\ hitting\ circle\ area}{number\ of\ points\ hitting\ square\ area}$$

$$= \frac{area\ of\ circle}{area\ of\ square}$$

$$= \frac{\pi \times r \times r}{4 \times r \times r} = \frac{\pi}{4}$$

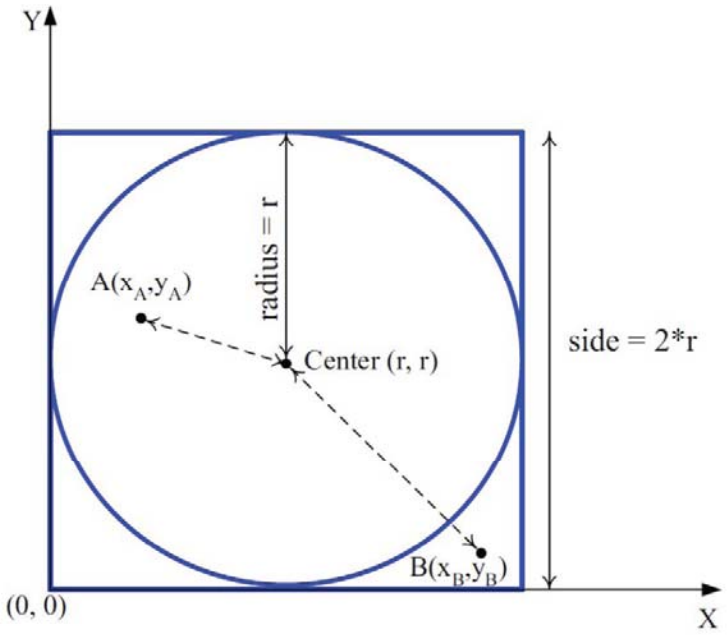
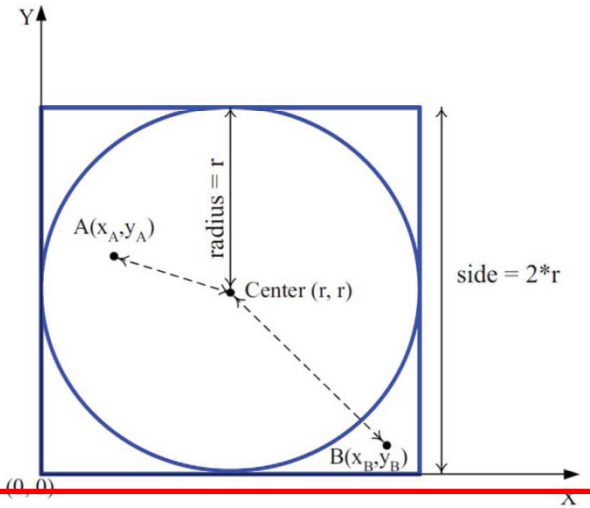


Figure 1: A Circle Circumscribed by a Square

$$\pi = 4 \times \frac{number\ of\ points\ hitting\ circle\ area}{number\ of\ points\ hitting\ square\ area}$$

Approximation of Pi

- How to throw the points randomly ?
  and make sure they are in the square ?
  - srand(), rand(), and RAND_MAX
  - For both x and y
- How to decide if the point is in the circle ?
  - Calculate the distance between (x, y) and (r, r)



$$Distance(P,Center) = \sqrt{(x-r)\times(x-r)+(y-r)\times(y-r)}$$