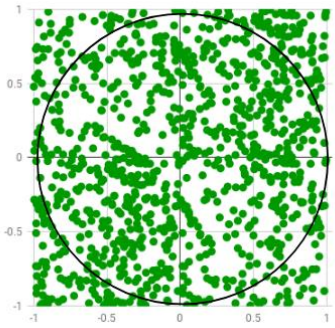
Computer networking exam

Write a client-server to approximate the value of PI. The idea is to simulate random (x, y) points in a 2-D plane with domain as a square of side 2r units centered on (0,0). Imagine a circle inside the same domain with same radius r and inscribed into the square. We then calculate the ratio of number points that lay inside the circle and total number of generated points.



$$\pi = 4 * \frac{\text{no. of points generated inside the circle}}{\text{no. of points generated inside the square}}$$

The server will listen to both an UDP and on a TCP socket.

- On the UDP socket it will receive from each client two numbers between 0 and 100. Upon receiving the number, it will convert it in the range [-1, 1] and it will update its approximation of PI.
- On the TCP socket, the clients will receive periodically from the server the current approximation of PI.

The clients:

- On the UDP socket, they will periodically send to the server two numbers between 0 and 100.
- On the TCP socket, they will receive the server's approximation of PI and will display it to the screen.

The application will end when the difference between two PI approximations is less than e = 0.0001.

Rubric:

- 1p: default.
- 4p: On a TCP socket the client sends 2*N numbers to the server, and the server responds back with another number.
- 2.5p: The program uses both TCP and UDP sockets.
- 2.5p: The server can handle multiple clients at once.