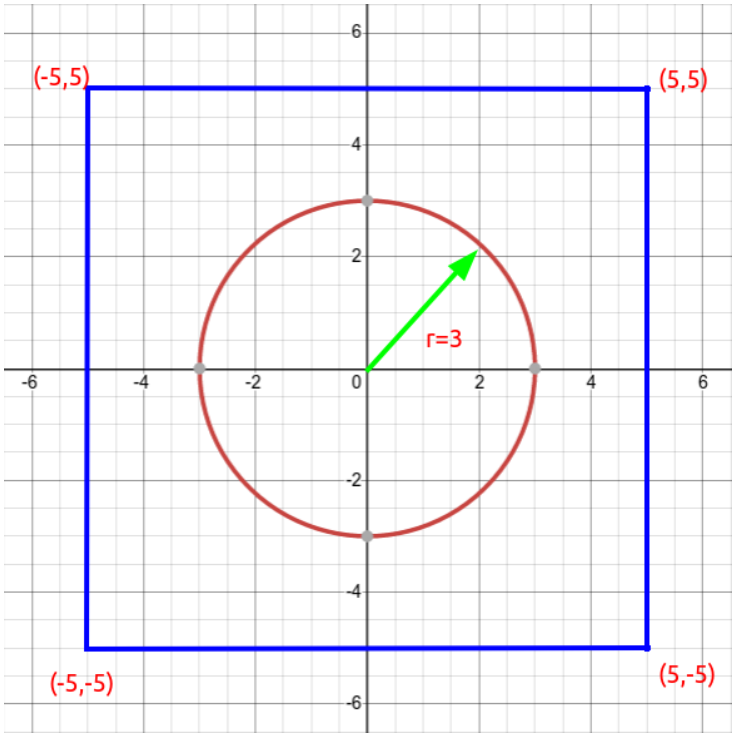
Assignment 02 Specification

Section C

Problem 1:

See the following figure.



Using Monte Carlo simulation, find the value of PI and area of the circle **using the given circle and square**.

Simulate for N = 100, 1000 and 10000.

Provide the following outputs for each N:

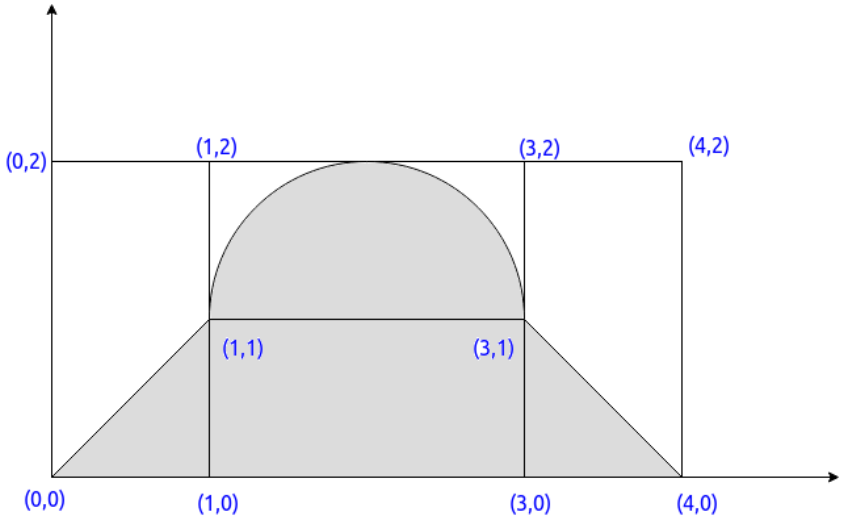
a. Scatter plot of the sample points (red points inside of the circle, blue points outside of the circle),
b. Estimated value of PI,
c. Estimated value of the area of the circle.

At the end of the simulation, draw two bar diagrams:

I. First bar plot: x-axis: N (number of trials); y-axis: PI value
II. Second bar plot: x-axis: N (number of trials); y-axis: Area of the circle

Problem 2:

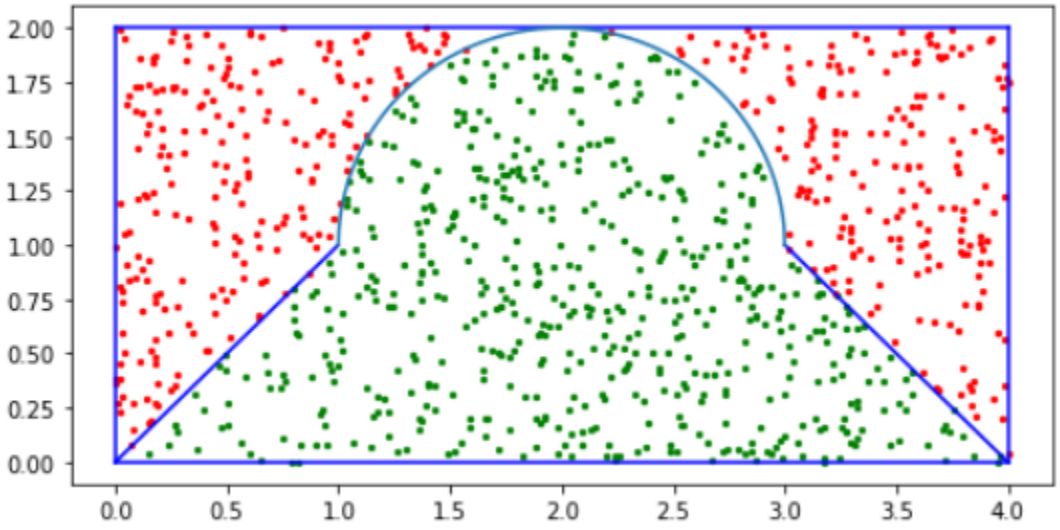
Find the shaded area **using the Monte Carlo simulation**. Use the drawn rectangle.



Simulate for N = 100, 1000 and 10000.

Print the value of area and draw scatter plot (as shown below) for each N.

Scatter plot example for N = 1000:



Instructions:

1. **Code each problem in separate python files. (problem1.py, problem2.py etc.)**
2. **Create a folder. Rename it with your 9-digit student ID.**
3. **Put all your python files into the folder.**
4. **ZIP the folder and upload to LMS submission window.**
5. **Deadline: Friday 11:55 PM.**
6. **Do not copy! Copy checker will be used during evaluation. Negative marking is possible.**