EE3206 Test 2, 2021/22 Sem A

Question 1. (10 marks)

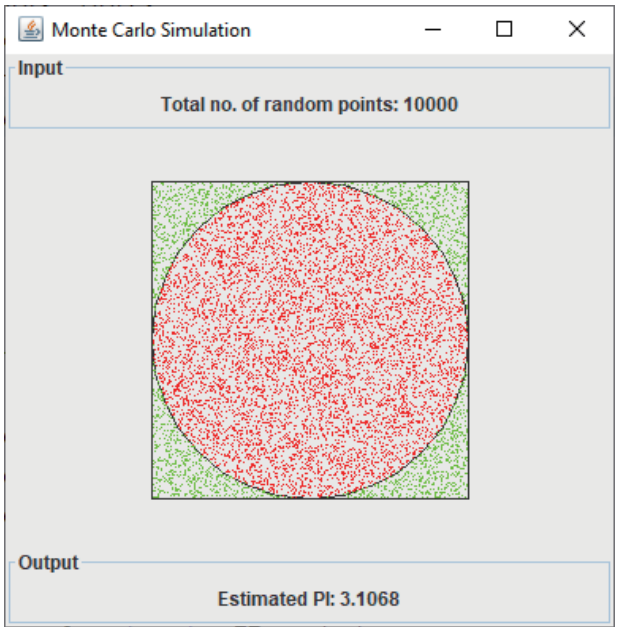
The following Euler's formula defines PI as the sum of an infinite series.

$$\frac{\pi^2}{6} = \sum_{k=1}^{\infty} \frac{1}{k^2}$$

You are asked to write a multithreaded program to compute the sum of the first **500,000,000** terms of the series using **Fork-Join Framework**. Each subtask should compute no more than **50,000** terms. Your main method needs to print out the estimated PI value and append the PI value to a file named PI_XXXXXXXX.txt in your working directory. Also, name your class Q1_XXXXXXXX.java. The X-string in both files is your actual student ID.

Question 2. (10 marks)

Write a GUI program to simulate throwing darts at a dartboard. You need to construct the same layout and display the same information as shown in the figure below.



- The program generates 10000 random points distributed in a 200x200 square.
- The square is positioned in the center of the window.
- The points inside the circle are red, and the others are green.
- Based on the Monte Carlo method, estimate the PI value and show it in the lower panel.
- Name your class Q2_XXXXXXXX.java where the X-string is your actual student ID.