README File for the Simulation

This C++ program simulates Bertrand's paradox, which deals with the probability of selecting a chord from a circle that is longer than the side length of an inscribed equilateral triangle.

Bertrand's paradox is a classic problem in probability theory that demonstrates how the choice of method for selecting random elements can influence the resulting probability. This simulation explores three different methods of selecting chords from the circle and calculates the probability that the chord length is greater than the side length of the inscribed equilateral triangle.

1). Methodology

The program implements three different methods for selecting chords:

- Distance from Center Method: Randomly selects a point on the circumference of the circle and calculates the chord length based on the angle formed with the center of the circle.
- Angle-Chord Method: Randomly selects an angle within the range (0, π) and determines if the corresponding chord intersects the inscribed equilateral triangle.
- Mid-Point Chord Method: Randomly selects two points on the circumference of the circle and calculates the chord length based on the difference in their sine values.

2). How to Use ??

- Compile: Compile the program using any C++ compiler. For example, you can use `g++`:

```
g++ -o bertrand_sim bertrand_sim.cpp
```

- Run : Execute the compiled program:

```
./bertrand_sim
```

3). Input : Enter the number of iterations for the simulation when prompted. Higher numbers of iterations provide more accurate results but may require longer computation time.

4). Output : The program will display the probability estimates for each method based on the specified number of iterations.