

Assignment1:

This is an individual assignment

1. Write a program that prompts the user to enter a positive integer and obtains its square root in simplest form. For example, the simplest form for $\sqrt{18}$ is $3\sqrt{2}$ is, for $\sqrt{28}$ is $2\sqrt{7}$, and for $3\sqrt{648}$ is $18\sqrt{2}$. Here are some sample runs:

<Output>

Enter a positive integer: 1300 *<enter icon>*

sqrt(1300) is 10*sqrt(13)

<End Output>

<Output>

Enter a positive integer: 31 *<enter icon>*

sqrt(31) is sqrt(31)

<End Output>

<Output>

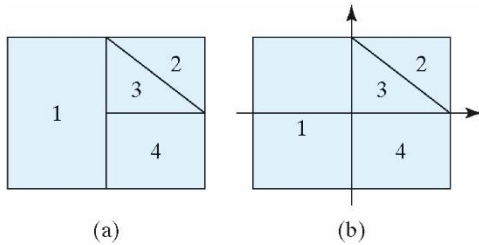
Enter a positive integer: 64 *<enter icon>*

sqrt(64) is 8

<End Output>

2. A square is divided into four smaller regions as shown below in (a). If you throw a dart into the square 1,000,000 times, what is the probability for a dart to fall into an odd-numbered region? Write a program to simulate the process and display the result.

(Hint: Place the center of the square in the center of a coordinate system, as shown in (b). Randomly generate a point in the square and count the number of times for a point to fall into an odd-numbered region.)



3. Write a program that generates a random point inside a circle. The circle is centered at (0, 0) with a radius 5. Display the point and its distance to the center. Here is a sample run:

<output>

The point is (-3.3878721143708708, 3.1409080280010944) and its distance to the center is 4.619846393950072

<end output>

<output>

The point is (-0.14972878708817536, 4.986535034124079) and its distance to the center is 4.9887824522852995

<end output>

Hint: use pow(),cos(angle), and sin() methods from Math class

static double	sin(double a) Returns the trigonometric sine of an angle.
static double	cos(double a) Returns the trigonometric cosine of an angle.