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COMP 115      Robots, Games, and Problem Solving

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Lab #4

In this lab, you will write short programs that use the graphics library.

We have seen in class how to draw Points using the graphics library. Open `graphics.pdf` in your browser and quickly read about the `Line` object. To construct a new line, you need to specify the two endpoints of the line. Once you have a line, you can use the `setFill` method to change the color of the line. For example, if the variable `aLine` contains a `Line` object, writing `aLine.setFill("blue")`

1. Write a program that creates a 500 x 500 window and draw four lines that will form a square 100 pixels away from the edge of the window. Each line should be a different color (available colors are blue, red, pink, yellow, green, black, orange, etc, most regular color in English are encoded).

Keep that program aside and show me together with the next exercise.

2. Write a program that asks the user for the length  $L$  of the side of a square. Using the graphics library, create an 800 x 800 window and draw a blue square with length  $L$  in the *middle of the window* (you can assume that  $L$  is less than 800). Then draw a yellow square *inside the middle* of the first. The second square can be of any size, but it has to be completely inside the first and in the middle of the first.

\_\_\_\_\_ Show me the result when you are done.

3. Write a program that asks the user for the length  $L$  of the side of a square. Using the graphics library, create an 800 x 800 window and draw a red square with length  $L$  such that the lower right corner of the square is in the middle of the window (you can assume that  $L$  is less than 400). Then, draw a pink circle inside the square in such a way that the center of the circle is the center of the square, and the outline of the circle touches the outline of the square.

(Optional) If you want an extra challenge, draw a yellow equilateral triangle in the center of the circle in such a way that the vertices (points) of the triangle touch the outline of the circle – the easiest way to do this is to have one of the points of the triangle directly above the center of the circle. You will probably need a bit of geometry or trigonometry for this, feel free to ask me for a hint if necessary, the math library may help, and you will need the `Polygon` object to draw the triangle.

Give a color to the outline of each shape that makes the outline easily visible.

\_\_\_\_\_ Show me the result when you are done.

4. Write a program that creates a 800 x 800 window and draws a histogram with 5 vertical bars. The two axes (one vertical, one horizontal) should be lines that meet 100 pixels above the bottom of the and 100 pixels to the right of the left border, and each should be 600 pixels long. The histogram should contain 5 vertical bars, each with a different fill color and a black outline, and the vertical bars should be equidistant but not touch each other. The bars can be of any height, as long as the heights are different.

\_\_\_\_\_ Show me the result when you are done.

When you are done, write your name on the sheet and hand it to the lab instructor.

Name: \_\_\_\_\_