

CSCI 1470 – Fall 2015
Lab 8 Assignment
Due Date: Monday Oct. 26, 11:00PM

Topic: Functions (*Pass by Value*)

Reading: Chapter 6.

Submit all source codes (*.cpp) at the same time via email to clarenceb@uca.edu and to tvelasco1@cub.uca.edu

***Note: Include the following set of comments at the top of your source code for all assignments.**

// Student Name:

// Assignment #: (Example: A8-1)

// Lab Time: Tuesday 2:40-4:30

*/*****Title of Program*****/*

Author:

Date of Work:

Design: Provide an general overall description of the program

Input:

Process:

Output:

******/*

1. (Save this file as A8-1.cpp.)

This program will allow the user to select two or three shapes and their colors and then draw the shapes.

Step 1. The user will select to draw one of the following:

1. Circle inside a Rectangle;
2. Rectangle inside a Circle;
3. Circle inside an Equilateral Triangle;
4. Equilateral Triangle inside a Circle;
5. Harry Potter's Symbol of the Deathly Hollows.

You should display the options and use a do-while loop to make sure that the user inputs an integer between 1 and 5.

Step 2. The user will select the colors of the two or three objects. You can provide them a list of colors (do not display the RGB values):

1. Red (256, 0, 0);
2. Green (0, 256, 0);
3. Blue (0, 0, 256);
4. Yellow (255, 255, 0);
5. Pink (255, 105, 180);
6. Purple (155, 48, 255);
7. White (255, 255, 255);
8. Black (0, 0, 0).

You should use a switch to assign the correct integer values to Red, Green and Blue.

Step 3. The user needs to input the radius and center.

Step 4. Use a switch to draw the desired options.

You will need to implement the following functions:

```
double drawFilledRectangle(int x1_left, int y1_top, int width, int height, int red, int green, int blue);
```

Draws a filled rectangle starting at (x1_left, y1_top) as the upper left corner with width and height. Returns the area of the rectangle.

```
double drawEmptyRectangle(int x1_left, int y1_top, int width, int height, int red, int green, int blue, int lineWidth);
```

Draws an empty rectangle starting at (x1_left, y1_top) as the upper left corner with width and height, with width lineWidth. Returns the area of the rectangle.

```
double drawFilledCircle(int xcenter, int ycenter, int radius, int red, int green, int blue);
```

Draws a filled circle centered at (xcenter, ycenter) with radius. Returns the area of the circle.

```
double drawEmptyCircle(int xcenter, int ycenter, int radius, int red, int green, int blue, int lineWidth);
```

Draws an empty circle centered at (xcenter, ycenter) with radius, with width lineWidth. Returns the area of the circle.

```
double drawEmptyTriangle(int x1, int y1, int x2, int y2, int x3, int y3, int red, int green, int blue, int lineWidth);
```

Draws an empty triangle with corners (x1, y1), (x2, y2) and (x3, y3), with width lineWidth. Returns the area of the triangle.

```
double drawColoredLine(int x1, int y1, int x2, int y2, int red, int green, int blue, int lineWidth);
```

Draws a colored line from (x1, y1) to (x2, y2). Returns the length of the line.

All lines should have a width of 2.

Geometric Notes (remember that increasing y is going down in the graphics window):

1. For the circle inside a rectangle, the width and height of the rectangle is twice the radius;
2. For the rectangle inside the circle, the width and height of the rectangle is the radius times $\sqrt{2}$. The upper left corner is the circle center minus the radius * $\sqrt{2}/2$;
3. For the circle inside the triangle, the top point of the triangle is twice the radius above the circle's center. The two points on the bottom of the triangle are one radius below the circle's center and $\sqrt{3}$ * radius to the left and right of the circle's center;
4. For the triangle inside the circle, the top point of the triangle is one radius above the circle's center. The two points on the bottom of the triangle are half a radius below the circle's center and $\sqrt{3}/2$ * radius to the left and right of the circle's center.

