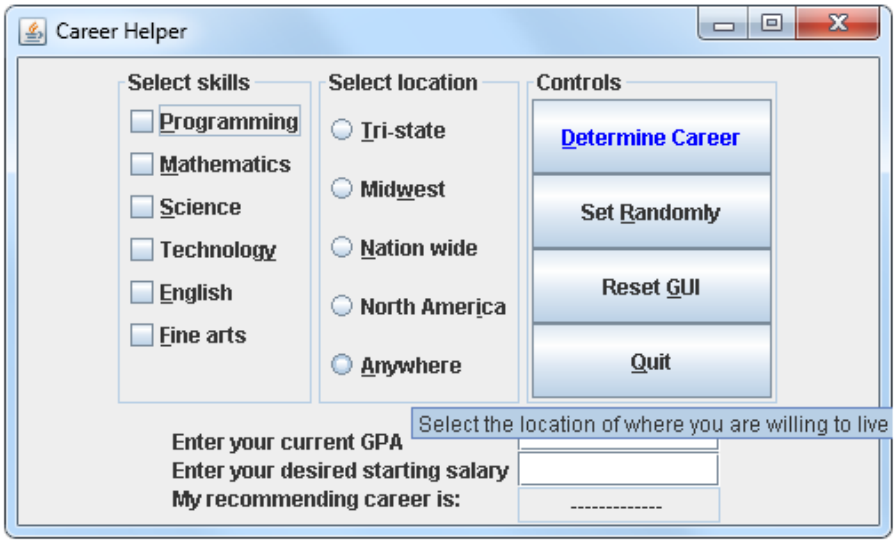
CSC 360 Programming assignment #6: GUIs and Graphics
Due date: Friday, October 17

In this assignment, you will create three separate programs. The first tests your ability to build a GUI and the latter two test your ability to use the Graphics class. Each of the three programs are worth 1/3 of the total grade for this assignment. Hand in your 3 classes and the output generated by each.

I. Create a GUI

Create the following GUI as best you can. This GUI consists of several JPanels (7 were used in this case), JCheckBoxes (the leftmost column), JRadioButtons (the center column), JButtons (the right column), JLabels (at the bottom along the left) and JTextFields (at the bottom along the right). The final JTextField has its editable value set to false, this is why the field appears with a different color.



The GUI includes mnemonics for each of the buttons and a toolTextTip for the radio buttons. It also has borders around the three sets of buttons. Although not visible, the four JButtons have a different cursor (I used HAND_CURSOR). Also the Determine Career JButton has a different foreground color.

Your GUI does not have to match this GUI, however you should try to format it nicely and include the mnemonics and toolTextTip. Other features such as images, different colors and borders, different names or Strings used for the buttons and labels can be altered as you desire as long as your GUI has roughly the same number of items. Warning: don't make it so flashy that it is annoying to look at!

NOTE: Your GUI will not respond to any of the JButtons. That is, it will not actually compute anything or obtain input from the JTextAreas. We will study how to do this in upcoming chapters. Your goal in this assignment is merely to build the GUI itself.

Your program should consist of a main method which creates an instance of an inner class. This inner class may either extend JFrame or JPanel, your choice. The inner class will consist solely of a constructor which will build the GUI. Aside from commenting the outer and inner classes themselves, you may leave the constructor's comments as minimal, such as

```
// define JCheckBoxes for skills

// define JRadioButtons for choice of location
```

II. Draw an Image

Create a program that consists of a main method that creates a JFrame and inserts an instance of a nested inner class. This inner class will extend JPanel. The inner class will consist solely of one method, paintComponent. In paintComponent, draw a scene of some kind such as a house, a car, the sky with clouds and balloons, etc. Your paintComponent must consist of various Graphics messages that include at a minimum: some filled and drawn rectangles and ovals, at least one polygon, at least one String (drawString) and at least one image (drawImage). Use a variety of colors.

This program can also be minimally commented. In paintComponent, comments should describe each portion of the drawing such as:

```
// drawing frame for house
…
// drawing door
…
// drawing chimney
…
// drawing sky
…
```

III. Recursive drawing

Create a recursive program to generate the following image consisting of circles with circles drawn recursively inside. The outer circle is centered at 600,600 and is 1200 in radius. Each recursive circle has a diameter ¼ the size of its outer circle and there are 4 recursive circles inside each outer circle. Implement the program to generate this image. The program will consist of a main method which creates a JFrame and creates an instance of an inner class. The inner class extends JPanel and consists of a paintComponent from which the first call to a recursive method is made. This call must include the Graphics object available in paintComponent. The recursive call will also require parameters that specify where to draw the next circle. The recursive method will be the only method to actually draw upon the Graphics object (do not draw anything from paintComponent although you can set the color and do other things as necessary). NOTE: this image is slightly too large for my desktop, so the bottom edge is cut off. The depth of recursion in this case must be at least 4. Any greater depth will result in circles too small to see given the resolution of my desktop. You are free to increase your resolution if desired. Comment your code!