Lab 9

Name: ____________________________       Checked: ______

Objectives:

More practice designing classes and methods.
Practice creating graphical objects.

Useful Links:

- www.csc.villanova.edu/~map/1051/Chap04/Splat.java
- www.csc.villanova.edu/~map/1051/Chap04/SplatPanel.java
- www.csc.villanova.edu/~map/1051/Chap04/Circle.java
- www.csc.villanova.edu/~map/1051/Chap02/Snowman.java
- www.csc.villanova.edu/~map/1051/Chap04/Die.java
- www.csc.villanova.edu/~map/1051/Chap04/Account.java
- **lecture slides:** www.csc.villanova.edu/~map/1051/s15/04Classes2.pdf

1. Starting with the Happiness, HappinessPanel, and Smiley classes from the GUI class exercise - see [http://www.csc.villanova.edu/~map/1051/s15/04GUIExercise.html](http://www.csc.villanova.edu/~map/1051/s15/04GUIExercise.html)

a) Demonstrate your program and GUI Object exercise worksheet:

Lab Partner name: _______________________________________________

Lab Partner comments:

Instructor/TA initials: ________________

b) Modify the Smiley class further, making it more like the Person class - i.e., add **name**, **age**, and **happiness** state attributes.

You will need to also modify the way the constructor and the **draw()** methods work:

- Add another constructor with more parameters that allows you to set the **name**, **age**, and **happiness** to other values.
- Modify the old constructor (the one that only has color, x, and y as parameters): it should also set the **name**, **age**, and **happiness** to some default values, such as “Smiley”, 0, and `true`, respectively.
- Modify the **draw()** method so that the smiley looks different depending on the **age** and **happiness** state and to include the **name** (Hint: Use the **drawString()** method to display the **name** below the smiley).

Test your code well before proceeding.
2. A Snowman class

Create a Snowman class, similar to the Smile class. You can use much of the code from the Snowman applet – the constants MID and TOP will now be your instance variables, corresponding to the x, y position, as in the Smile class. (You should rename MID and TOP to x and y or to mid and top and declare them private). You don’t need any other instance variables, unless you plan to have different versions of the Snowman (eg: arms up vs. arms down).

Test your code by drawing a few Snowmen in your HappinessPanel.

3. A draw() method for the Die class

A die can be depicted by a white square outlined in black, with the number inside (or you can take the challenge and try to make it look like a real die, but drawing the little dots corresponding to the faceValue is tricky).

Note that the Die class does not have x and y (position) attributes. Rather than adding these attributes, we will take a different approach, and incorporate x, y as parameters to the draw() method that we are writing. Thus, in the paintComponent() method of HappinessPanel, we will use:

```java
die1.draw(page, 40, 60);
```

(instead of `die1.draw(page);` which assumes die1 has a position)

Therefore, the draw() method in the Die class will need a different heading:

```java
public void draw( Graphics page, int x, int y)
```

The method definition should use the position x, y to draw the die:

a. use fillRect() to create a white square (or use it twice to create a white square with a black outline)

b. use drawString() to put the String corresponding to faceValue inside the white square. Note: remember that faceValue is an int, so use Integer.toString(faceValue) to convert it to a String, as is done in the original toString() method of Die class.

c. Test your code by drawing a few dice in your HappinessPanel.

d. Test it again, inserting die1.roll() right before the draw() method is invoked in the paintComponent() method of HappinessPanel, for one of the dice. Observe the dice as you resize the window: note that the paintComponent() method is invoked every time the window is resized, so if a die is rolled in paintComponent(), you should see that die’s faceValue change as you resize.

Demonstrate your work

- Demonstrate how resizing the window alters the image: ______

- Files:
  - Happiness ______
  - HappinessPanel ______
  - Smile ______
  - Snowman ______
  - Die ______