Your Name:

Lab#7: Week of October 26, 2020

Due by midnight on your lab day.

This lab uses basecode which has been copied into your Lab07 folder.

Question 1. Consider the following code

```
class Timer {
  int mTime = 0;

  Timer() {
    reset();
  }

  void reset() {
    mTime = millis();
  }

  float getElapsedTime() {
    return (millis() - mTime)/1000.0;
  }
}
```

(a). In the code above, circle the constructors

(b). Classes contain data and methods. What are the data and methods of the class Timer?

(c). What variables are in scope in `Timer.getElapsedTime()`?

(d). What does the function millis() do?

(e). Suppose a user of Timer calls reset() at the start of the program and then calls getElapsedTime() 2.0 seconds later. In this scenario, what is the value of mTime? What is the value returned by millis()? What value is returned from getElapsedTime()?

Question 2. Write a class call `Light` that contains a constructor and a draw function. Your Light class should contain the following data: a color and a (x,y) coordinate. Use the basecode in your Lab07 folder as a starting point. The basecode draws a gray rectangle which you will extend in the next question. It also already defines a file for your Light class. You functions should satisfy the following specifications.

```
// CS110 Bryn Mawr
// Class for representing a light that can turn on/off

class Light {

  // constructor: set initial values for the data in Light
  // Input: c (color): the color of the light
  // Input: x (float): the center x position of the light
  // Input: y (float): the center y position of the light

  // draw: draw the light as either on or off
  //    Lights are drawn as ellipses with size 150,150
  // Inputs: on (boolean). When on is true, the light should
  //    be drawn with its color. When on is false, the light
  //    should be drawn gray
  // Returns nothing

}
```

Question 3. Use the Light and Timer classes to create two lights that alternate between on and off every two seconds (like a stop light).

(a). Instantiate (e.g. define and create) two lights as global variables. One light should be positioned at (250, 150) and one should be positioned at (250, 350). Make each light a different color. For example, in the picture below, the top light is red and the bottom light is green. Draw the two lights in draw() so that both are 'on'.
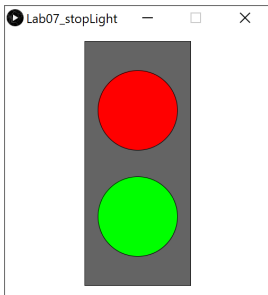
(b). Instantiate a timer as a global variable. In draw(), use the timer to determine when 2.0s have passed, e.g. implement the following algorithm

```
if the elapsed time is greater than 2.0s
    reset the timer
    print a message
```

(c). Use the timer to alternate which light is on. For example, when the top light is on, the bottom light should be off. When the bottom light is on, the top light is off. Every 2.0 seconds, alternate which light is on. Hint: define a variable to keep track of which light should be on. Submit your finished sketch to dropbox.