CMPS 10
Introduction to Computer Science
Lab Assignment 4

The goal of this project will be to write a Processing program that emulates the example ColorCircles posted on the class webpage. Follow the link below to see its operation.

http://ic.ucsc.edu/~ptantalo/cmps010/Spring14/Examples/ColorCircles.html

This program draws three overlapping circles in the processing window. Each circle corresponds to one of the primary colors: red, green, blue. When the mouse pointer enters one of the circles, the background changes to that circle's corresponding color. Notice that the circles themselves are transparent, i.e. not filled. Notice also that when the mouse pointer enters a region where two circles overlap, both colors are on, giving the background a mixed color. The overlapping regions therefore correspond to the mixed colors: yellow = red+green, cyan=green+blue, magenta=blue+red. When the mouse is in the intersection of all three circles all three colors are on, causing the background to be white=red+green+blue. When the mouse is in the region outside of all circles all colors are off, making the background black. It is as if the mouse being in a certain circle activates a colored light shining on the background, and those lights are allowed to mix in various ways. Read the link on the class webpage on "Colored Light vs. Colored Pigment" to learn about the different ways of mixing colors. Notice that when all lights are "off" the circles are outlined in white to contrast with the black background, while if any light is on the circles are outlined in black.

In the descriptions that follow we will refer to the three circles as R, G, B since they control the colored lights red, green and blue, respectively. All measurements are in pixels. The Processing window has dimensions 500x500. Each circle has radius 125 and has an outline that is 3 pixels wide. Circles R, G, B are centered at the following points in the Processing window.

   R: (width/2, height/2 – 100)
   G: (width/2 – 86, height/2 + 50)
   B: (width/2 + 86, height/2 + 50)

Here width and height are the system variables discussed in class giving the width and height of the Processing window. You should study the following examples in preparation for this assignment. Both are posted on the class webpage.

CircleRollover (http://ic.ucsc.edu/~ptantalo/cmps010/Spring14/Examples/CircleRollover/)
This example shows how to determine if the mouse pointer is within the interior of a circle, and how the background color (in this case black or white) can react to such an event.

ContinuousCurve5 (http://ic.ucsc.edu/~ptantalo/cmps010/Spring14/Examples/ContinuousCurve5/)
This example shows how to turn on and off the primary colors in reaction to user input (in this case keystroke events.) In particular it shows how one can mix the primary colors to get the non-primary colors: yellow, cyan, magenta, as well as black and white.

This project is considerably more difficult than previous ones, so it is worth more points and you have more time to complete it. Call your program ColorCircles, after the example. Begin the program with a standard comment block resembling the one below.
Save your program and attach the file ColorCircles.pde to the assignment name lab4 on eCommons. Be sure to start early and get help in lab sessions and office early if anything is unclear.