Programming Patterns

Creative Coding

**Goal**: Familiarize students with p5.js basics. Introduce them to variables, conditional statements, and color theory.

**Motivation**: Show students “aesthetic” color palettes/images and see if they can recognize what different abstract painting are representing.

**CT Themes**: Abstraction, Problem Decomposition, Algorithmic Design

Description

You will experiment with shapes and color in p5.js, be challenged to create different patterns and learn some basic concepts from color theory.

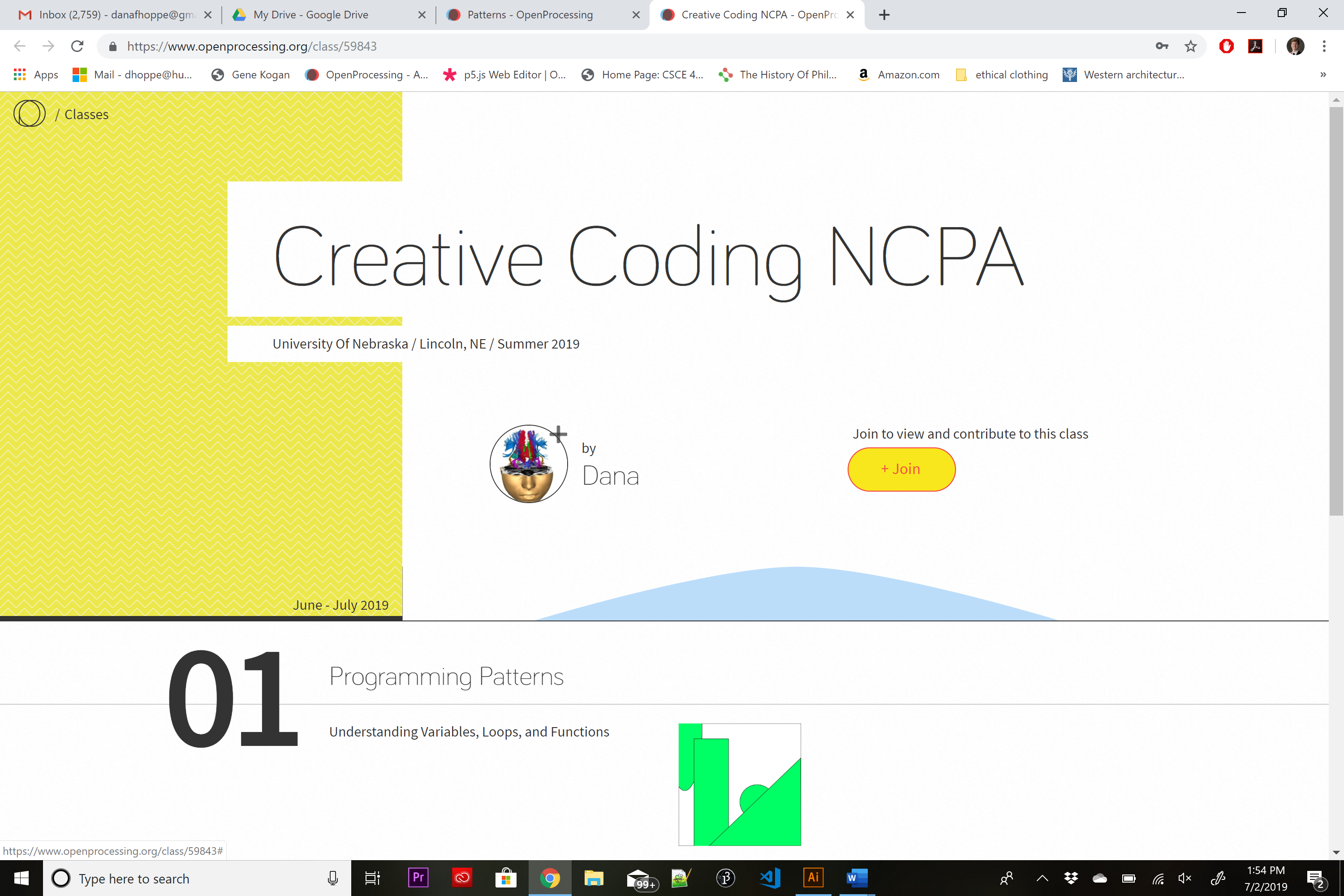
Part 1 – Experimentation

1. Log in to the Computer.

Username: Password:

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1. Go to <https://www.openprocessing.org/sketch/736493>

Click “Join”

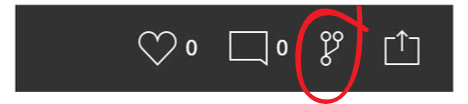
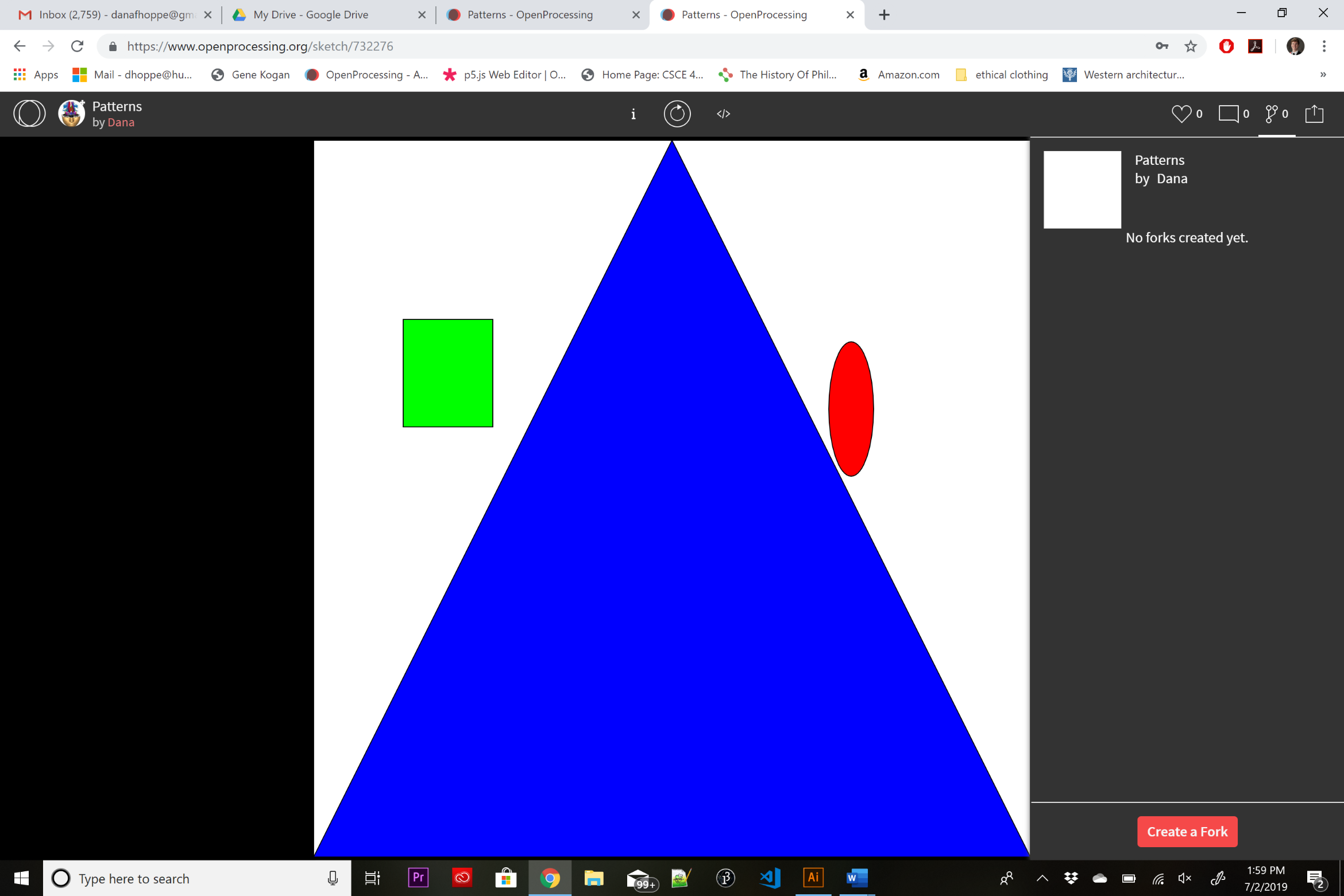
Create an account.

Class Code: BCB592

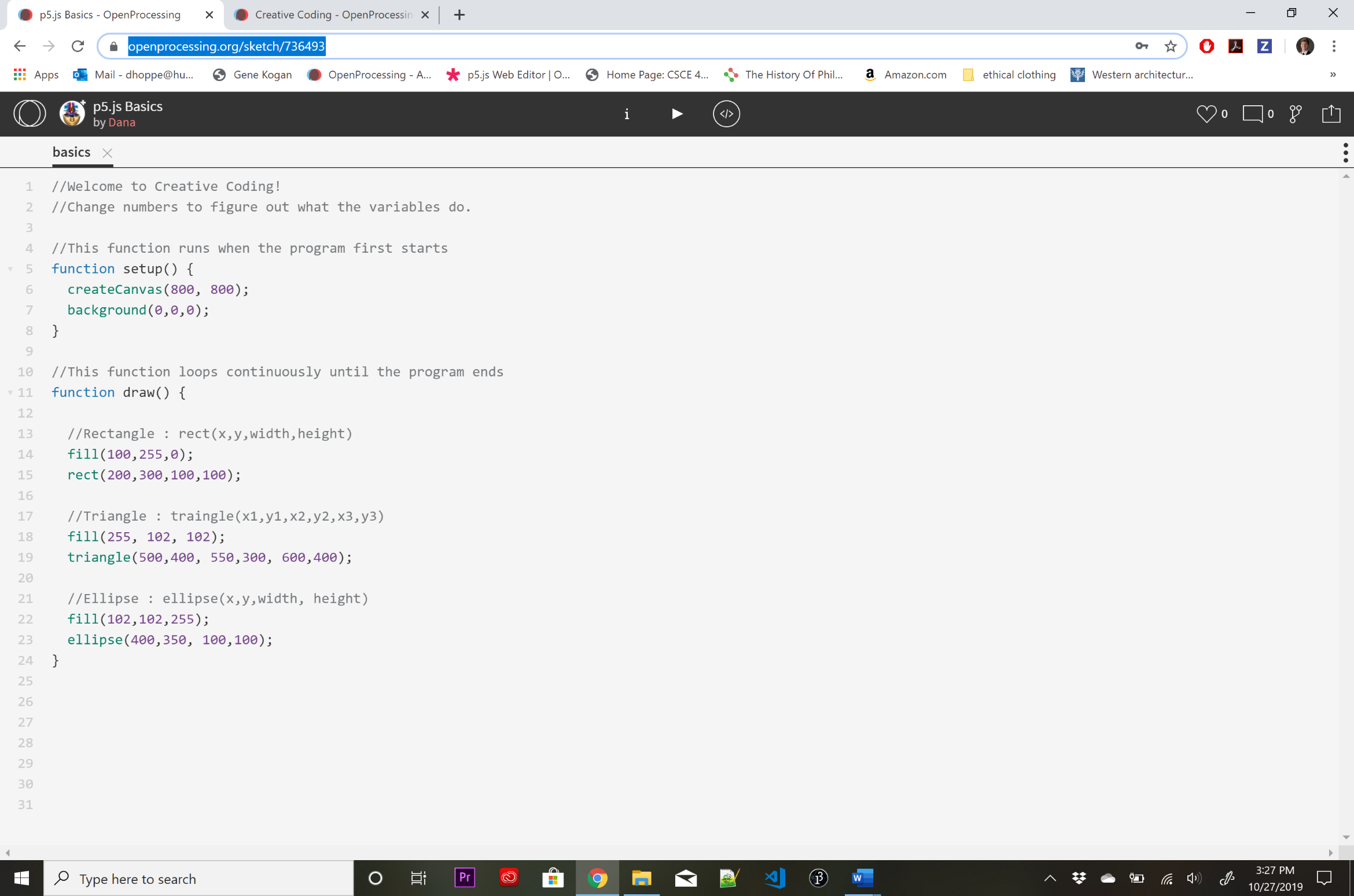
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1. Scroll down to “Lesson 1” and click on the sketch “p5.js Basics”.

On the upper right-hand side click the fork button and select “Create a Fork”



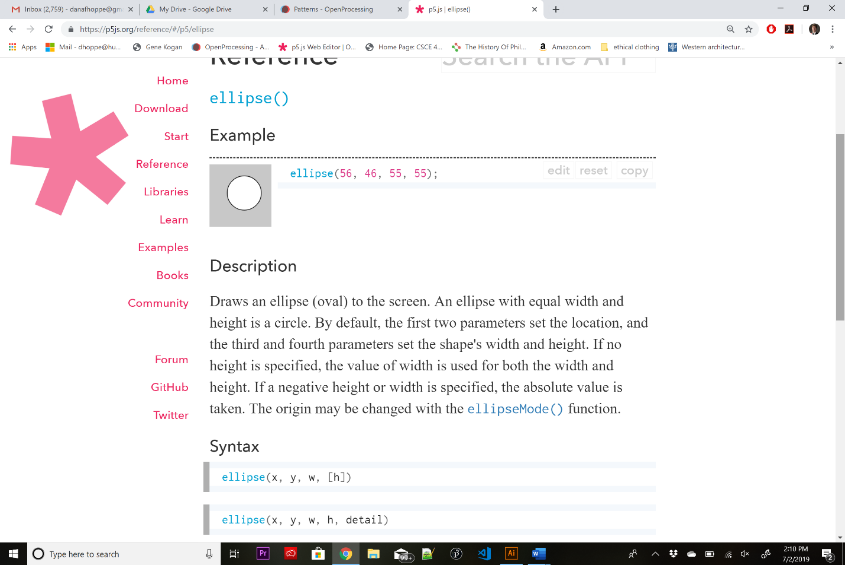
1. Go to the **edit code** tab.
2. Experiment with the code! Change the value of numbers and see what happens. To run the code, press the play button.



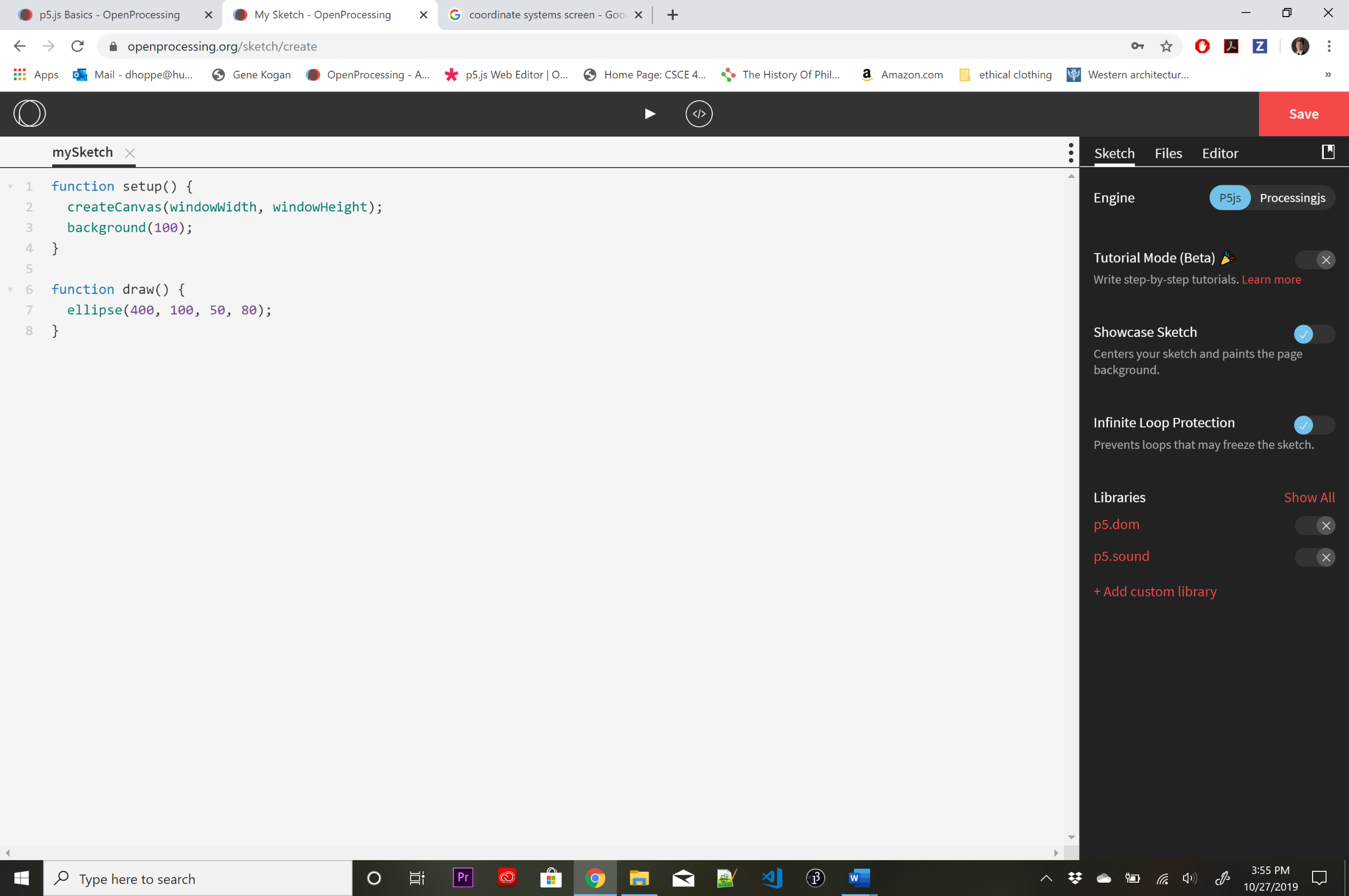


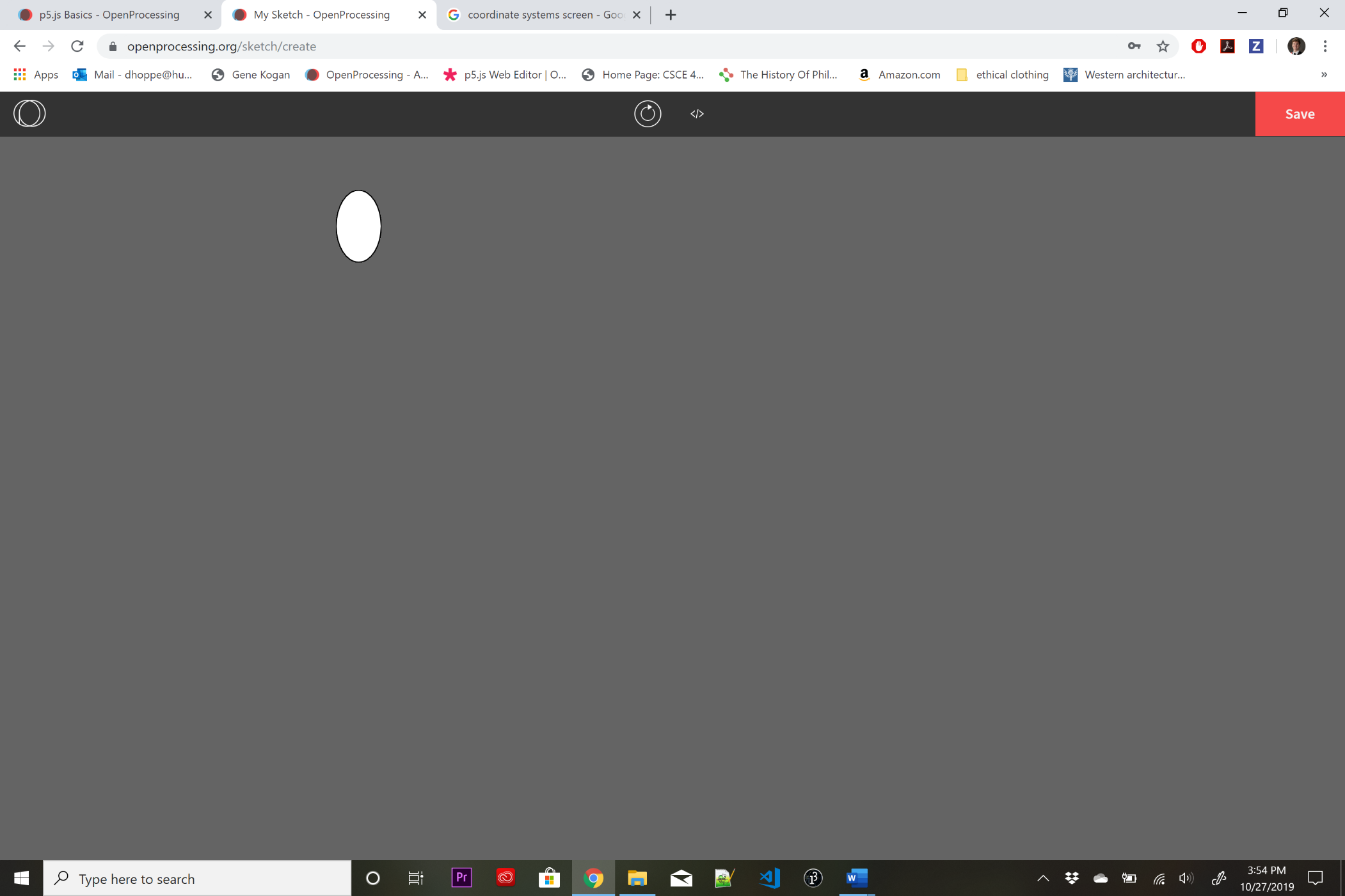
Part 2 – Explanation

**Function:** *a set of instructions which executes a desired task and returns the result to the user.*

You may have noticed that rect(), ellipse(), triangle() and fill() all have parenthesis after them and take in a set of numbers (called *parameters*) which tell the computer what to do. These are all functions.

For example, the ellipse() function takes in four parameters. The first two parameters control the position of the shape (x and y), and the second two control the size (width and height).





100 pixels down (y)

400 pixels right (x)

80 pixels high

50 pixels wide

The parameters of the fill() function control the red, green, and blue (RGB) values for the color of the object. The color defined will be assigned to every shape after the fill() function unless fill is redefined. The RGB values range from 0-255.

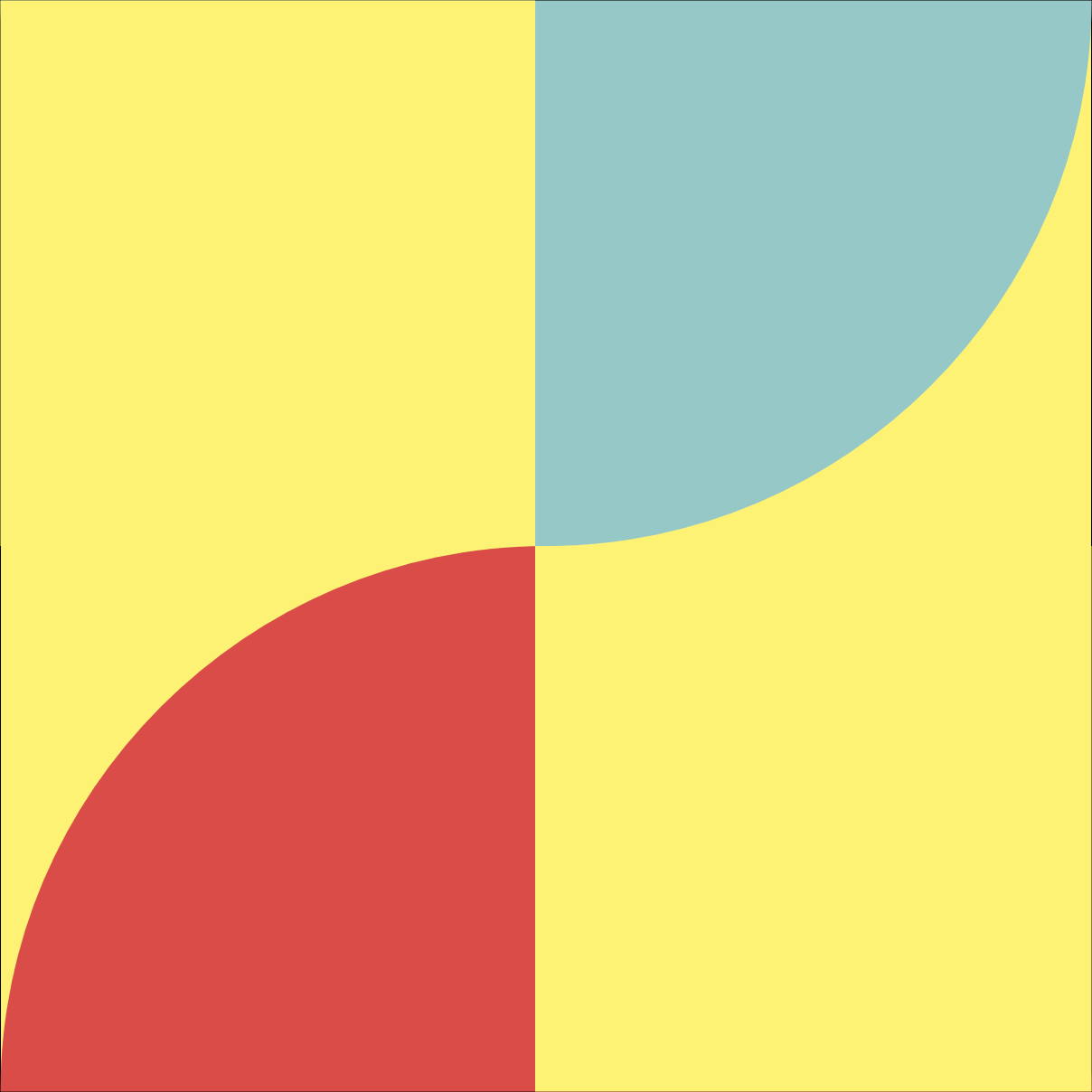
For help with RGB colors, use <https://www.rapidtables.com/web/color/RGB_Color.html>

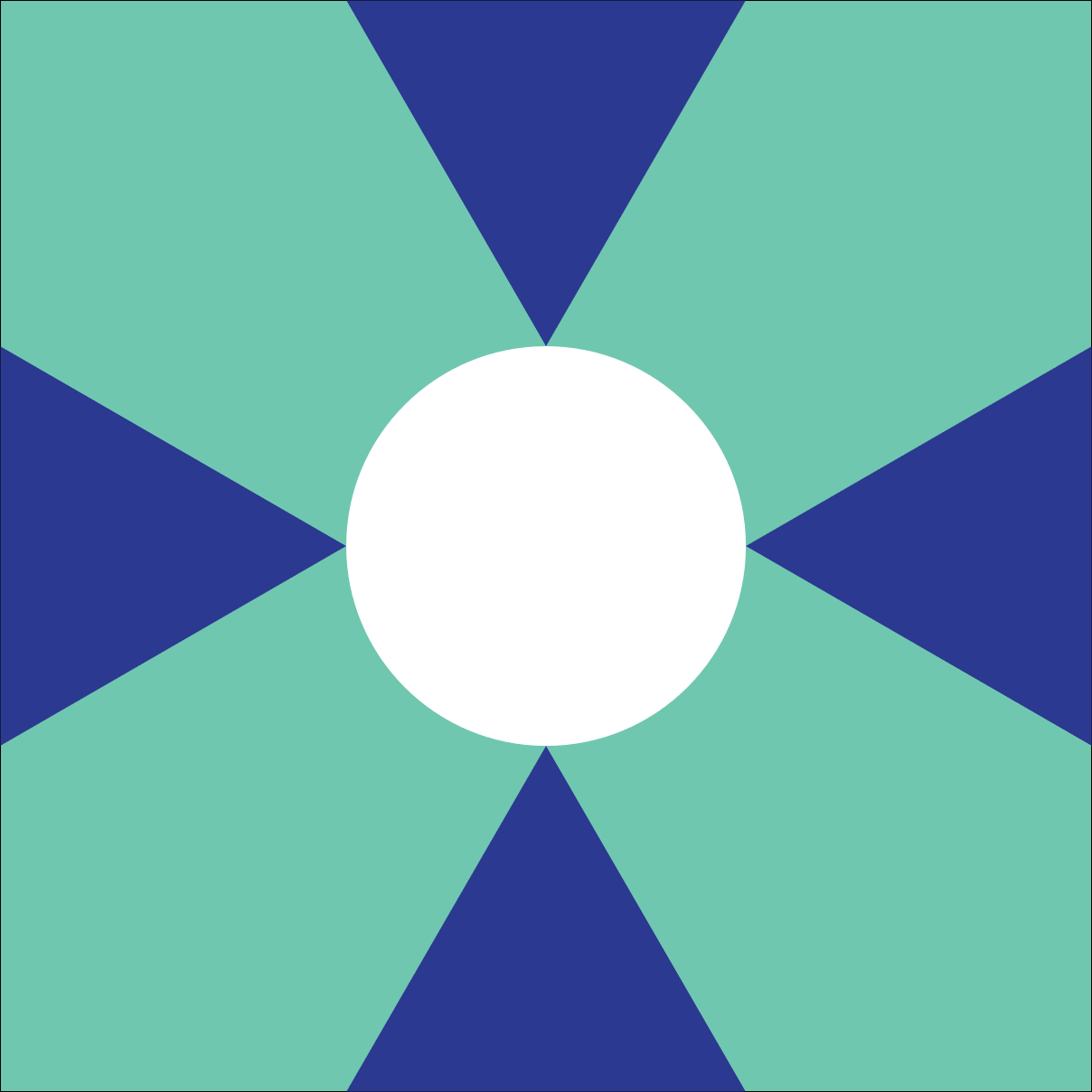
There are many different functions for creating shapes and colors in p5.js. For a more complete list of definitions and explanations of the different p5.js functions, go to:

<https://p5js.org/reference/>

Part 3 – Challenge

Using what you’ve learned, recreate one of the following images:

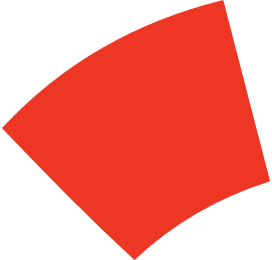
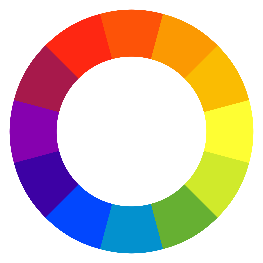




Part 4 – Concept

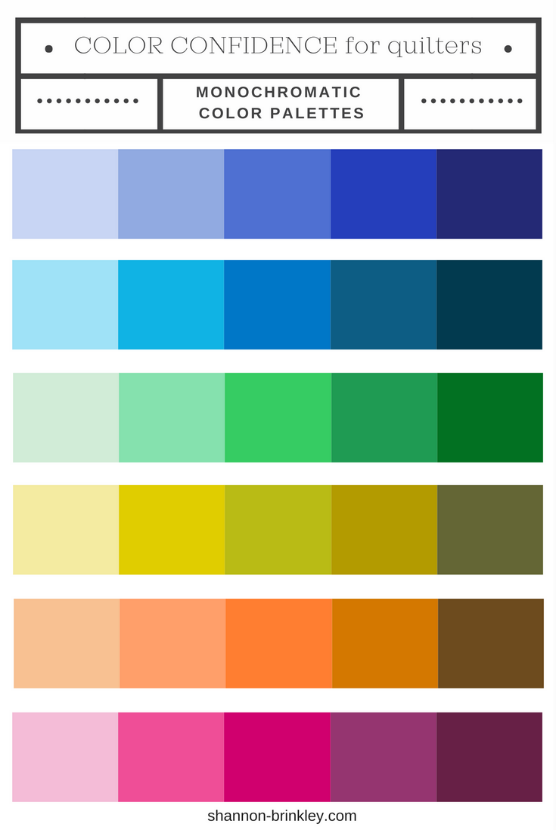
You may have noticed that you find certain color combinations to be more pleasing to look at than others. Often, these color palettes result from relationships which exist between colors. Here are a few common relationships used to develop color palettes:

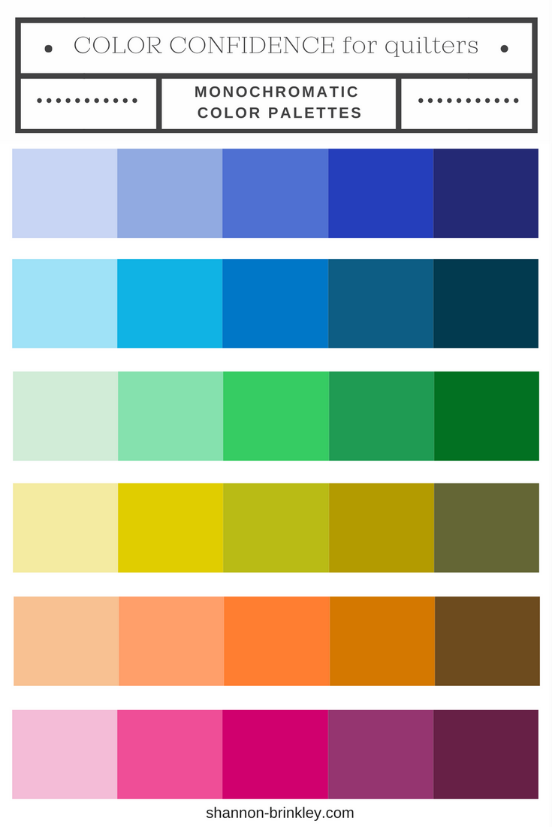
**Monochromatic**

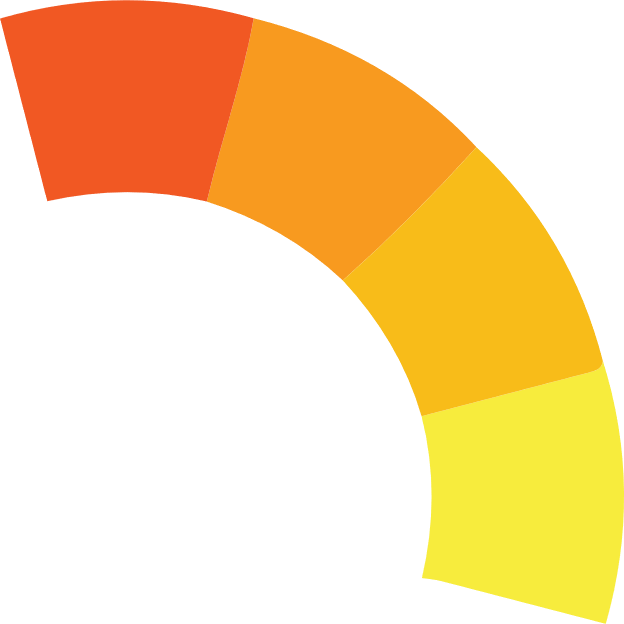
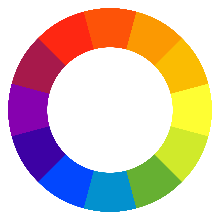


Consists of a single hue (such as red, blue, yellow etc.) And can vary by:

* Tint: amount of white
* Tone: amount of grey
* Shade: amount of black

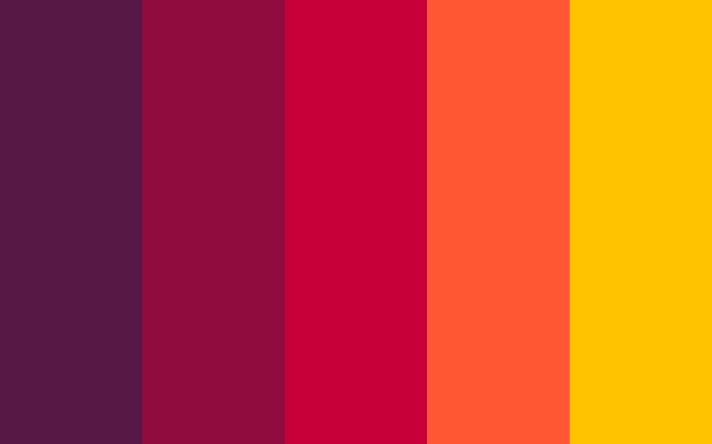
Monochromatic Blue Monochromatic Yellow

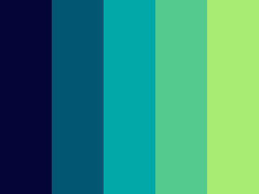




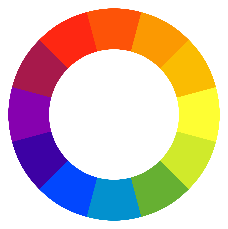
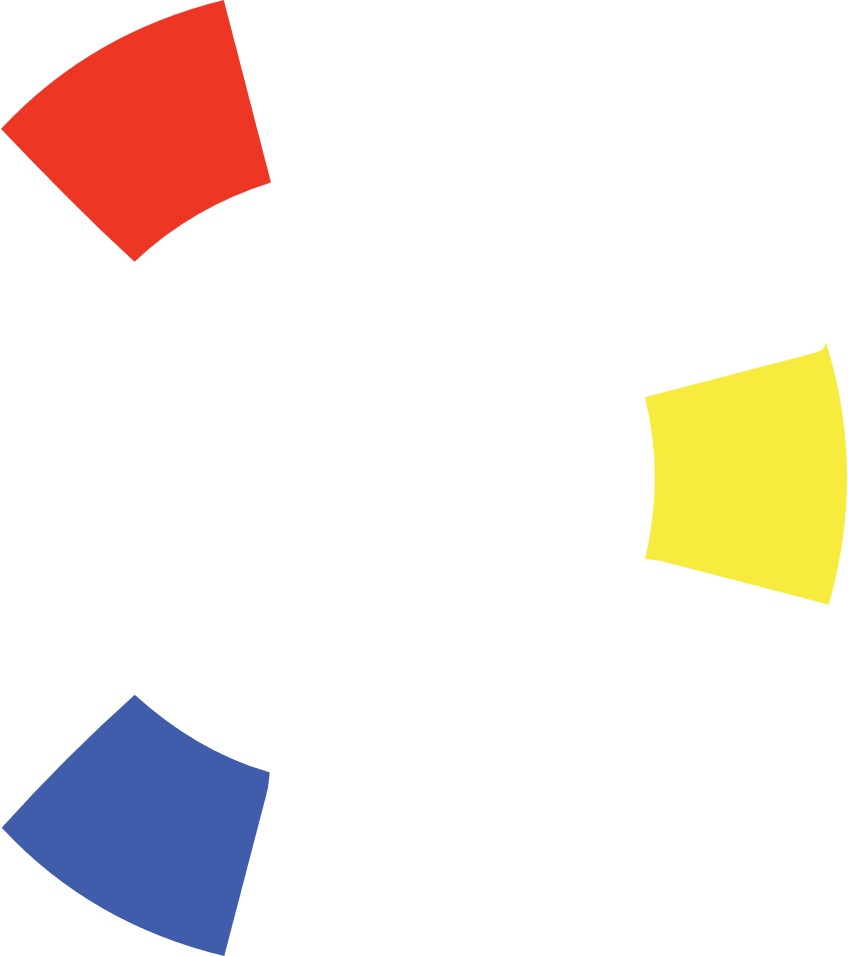
**Analogous**

Consists of three-four colors next to each other on the color wheel and variations in tint, tone, and shade.

Analogous Red, Orange, Yellow Analogous Blue, Green, Lime



**Triadic**



Consists of three colors equal distance to each other on the color wheel.

Triadic Red, Blue, Yellow

Color relationships are a good way to become familiar with creating color schemes, but don’t feel limited by them. There are many different ways to think about color!

Part 5 – Create

Using everything you’ve learned, create your own image!