Creative Coding with p5.js

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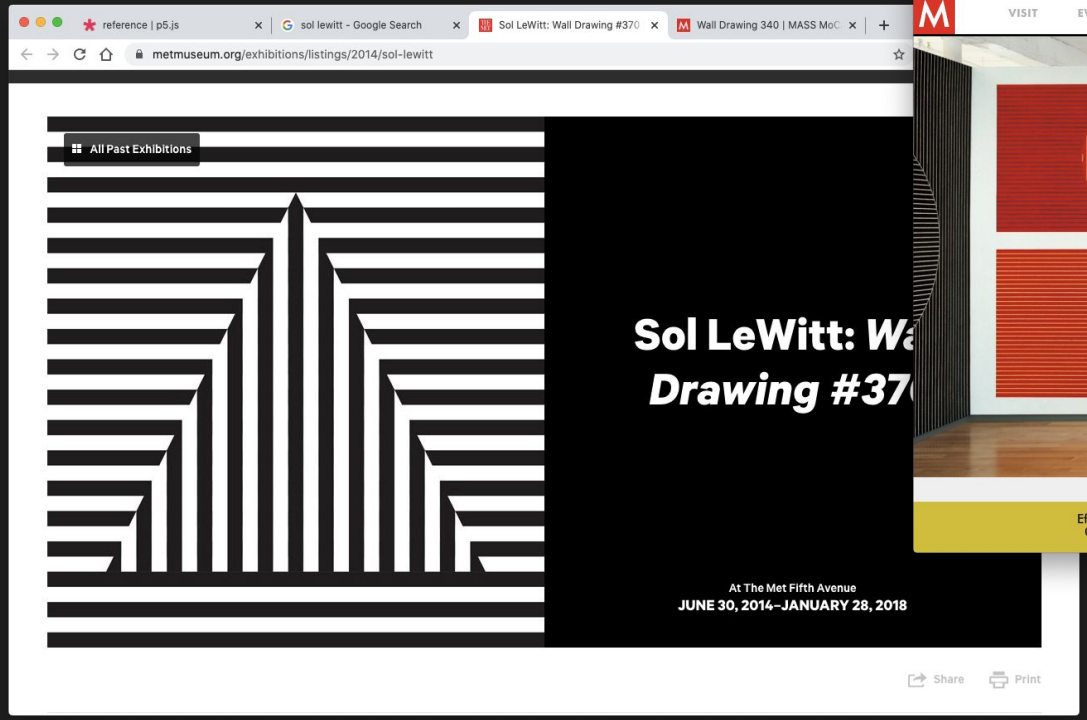
What is Creative Coding?

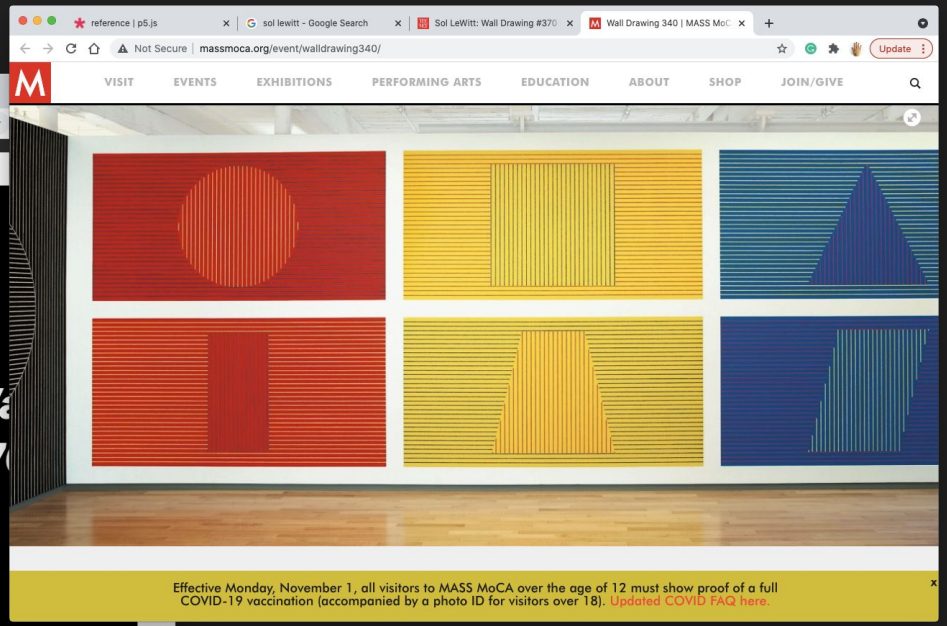
How can you apply creativity to programming?
What is the goal of creative coding?

Creative Coding:

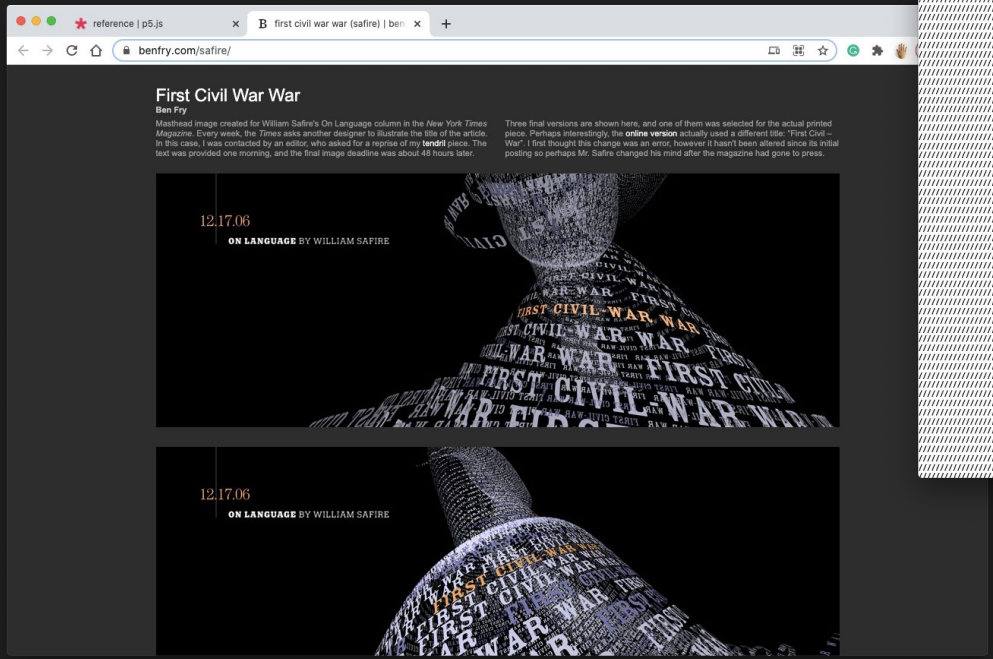
Using coding to express
an interest, a passion, or a message.

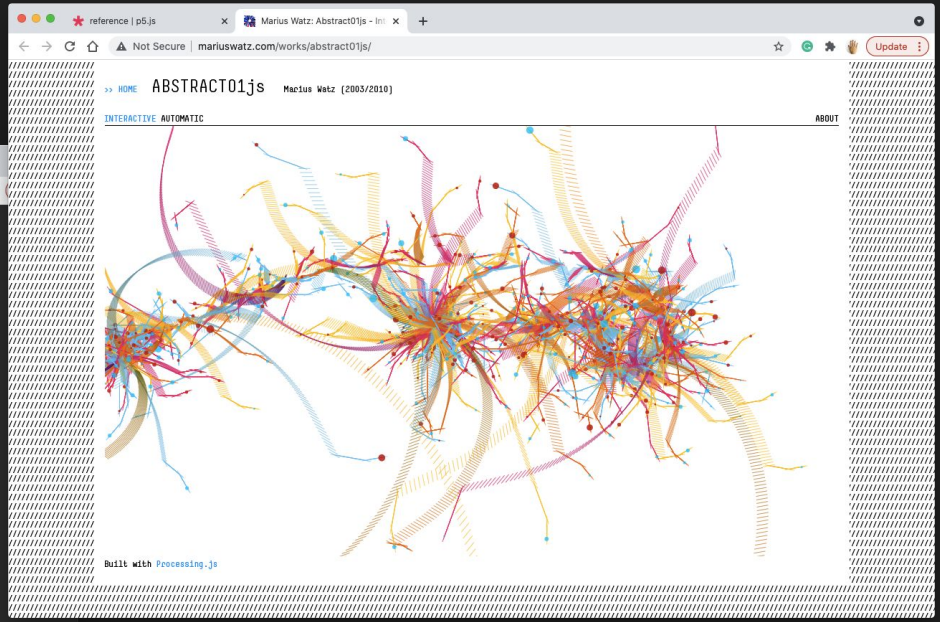
Algorithmic Art (Sol LeWitt)



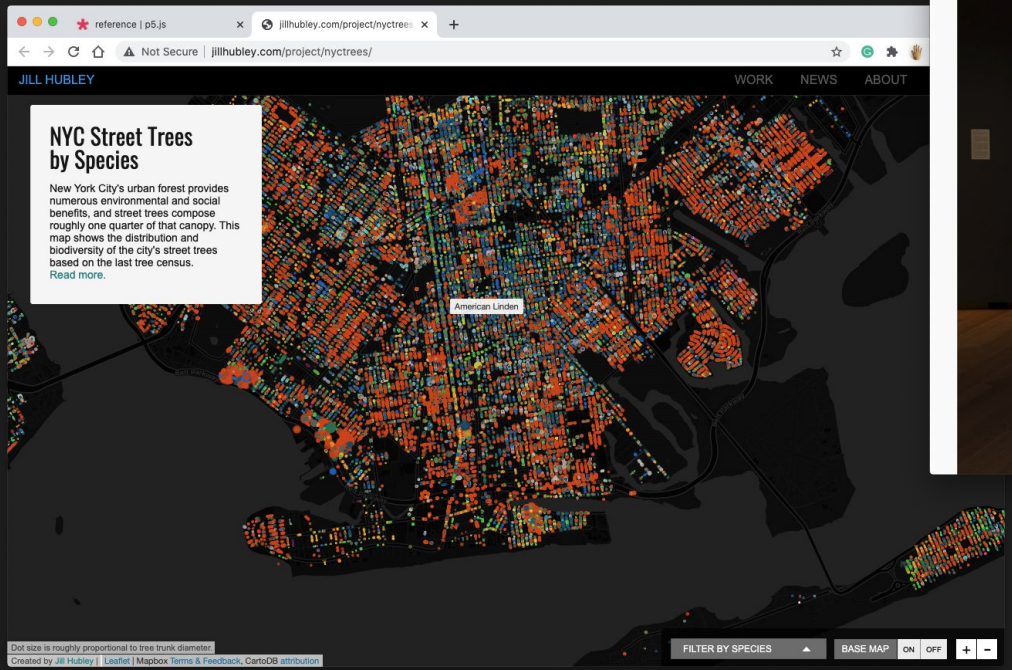


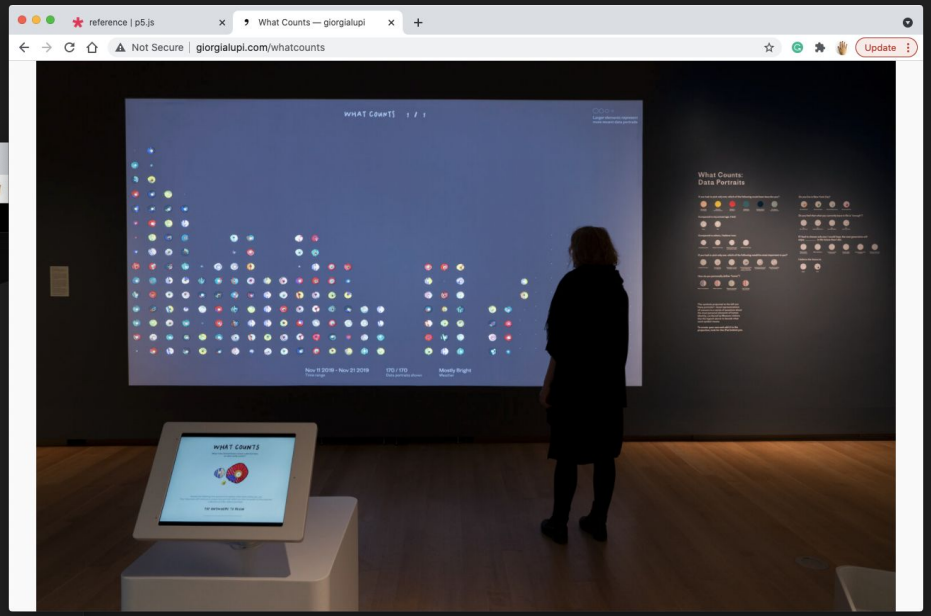
Generative Art



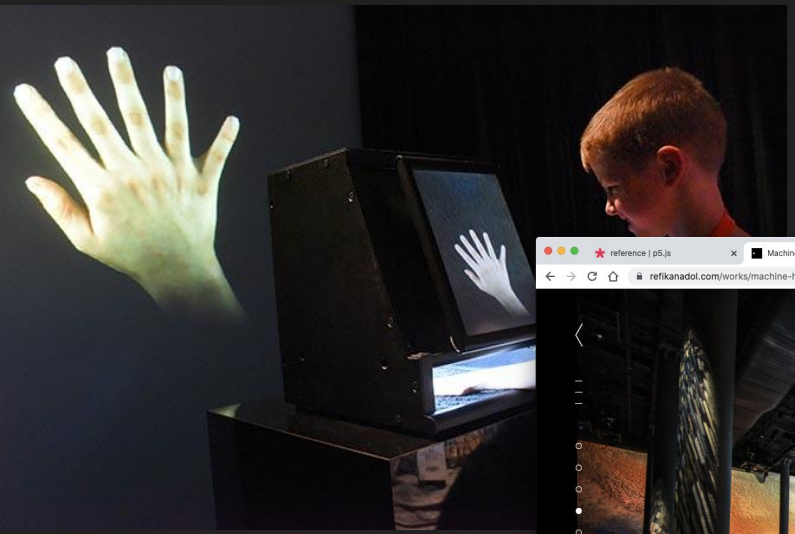


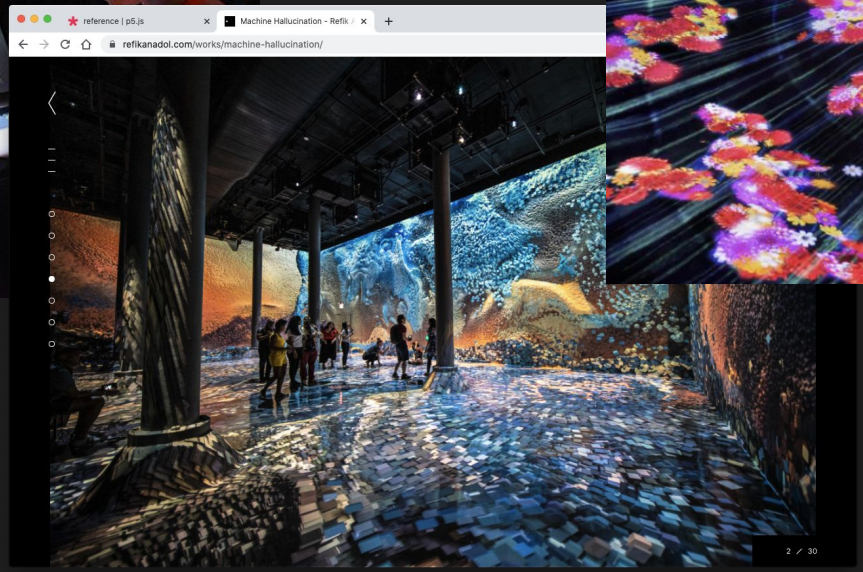
Data Visualization

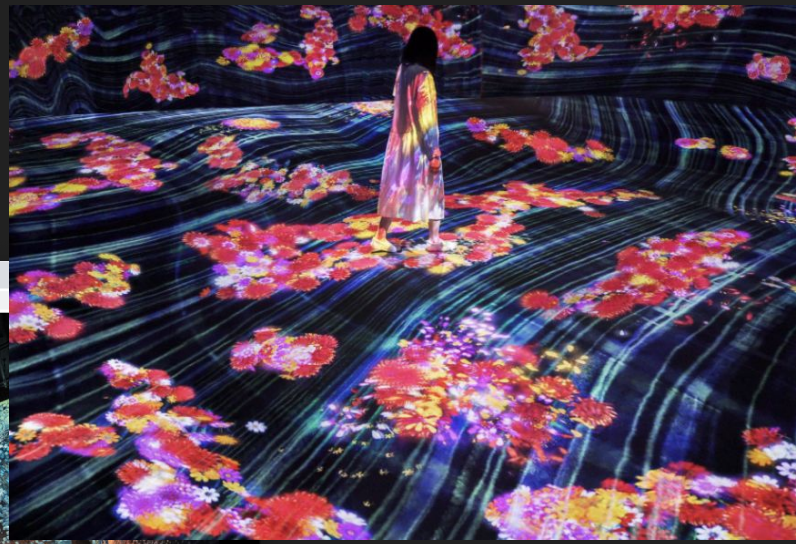




Immersive Experiences

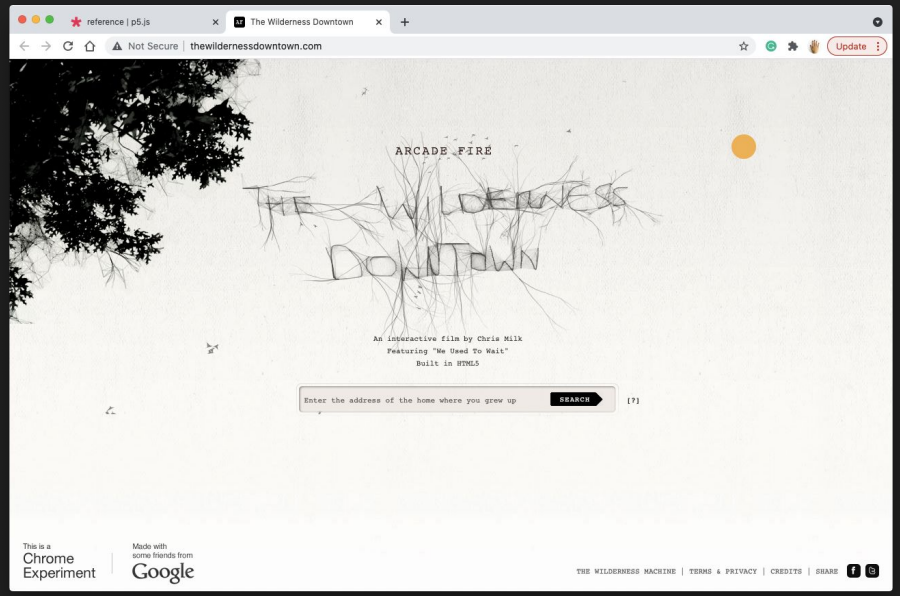


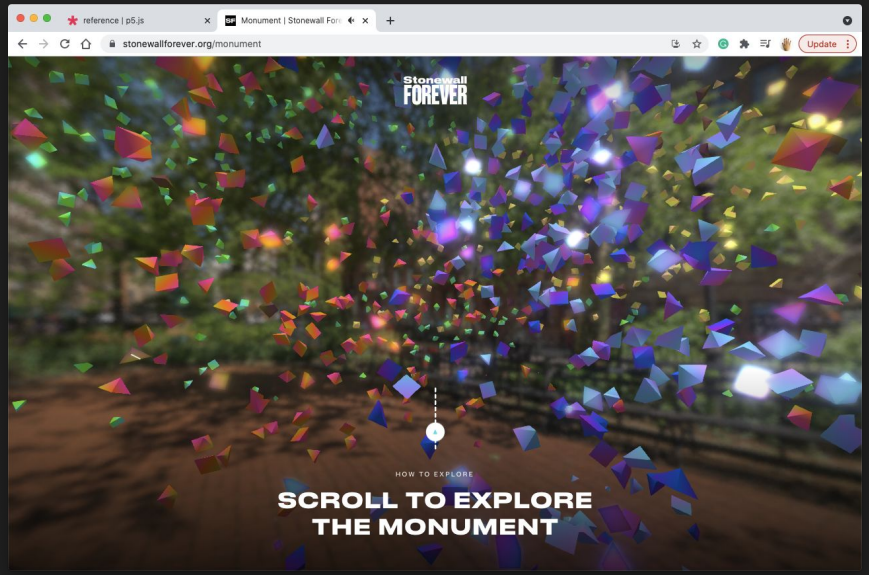




Interactive Installations

Interactive Films





What is p5.js?

Open-source JavaScript library for creative coding
that provides us with tools to simplify the process of creating
interactive visuals with code in the web browser.

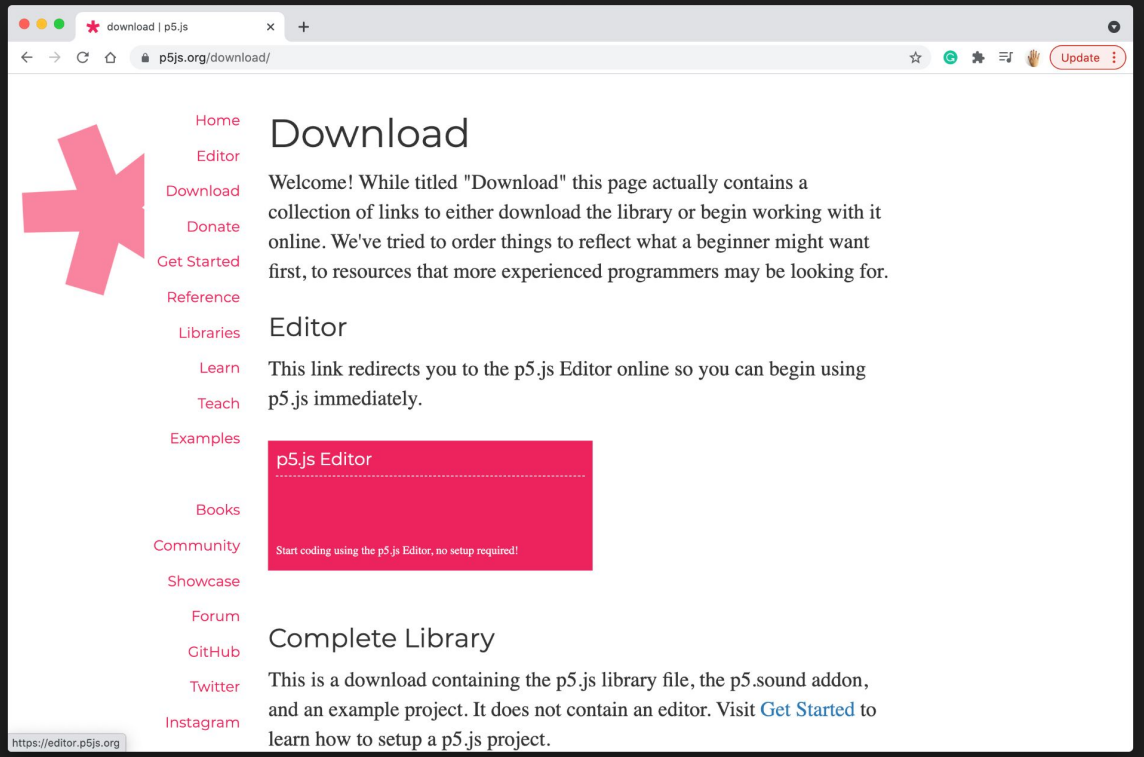
Using p5.js library: p5.js Editor

Navigate to p5js.org/download.

Click on the p5.js Editor button.

Create an account.

Projects in p5.js Editor is already set up with the p5.js library.



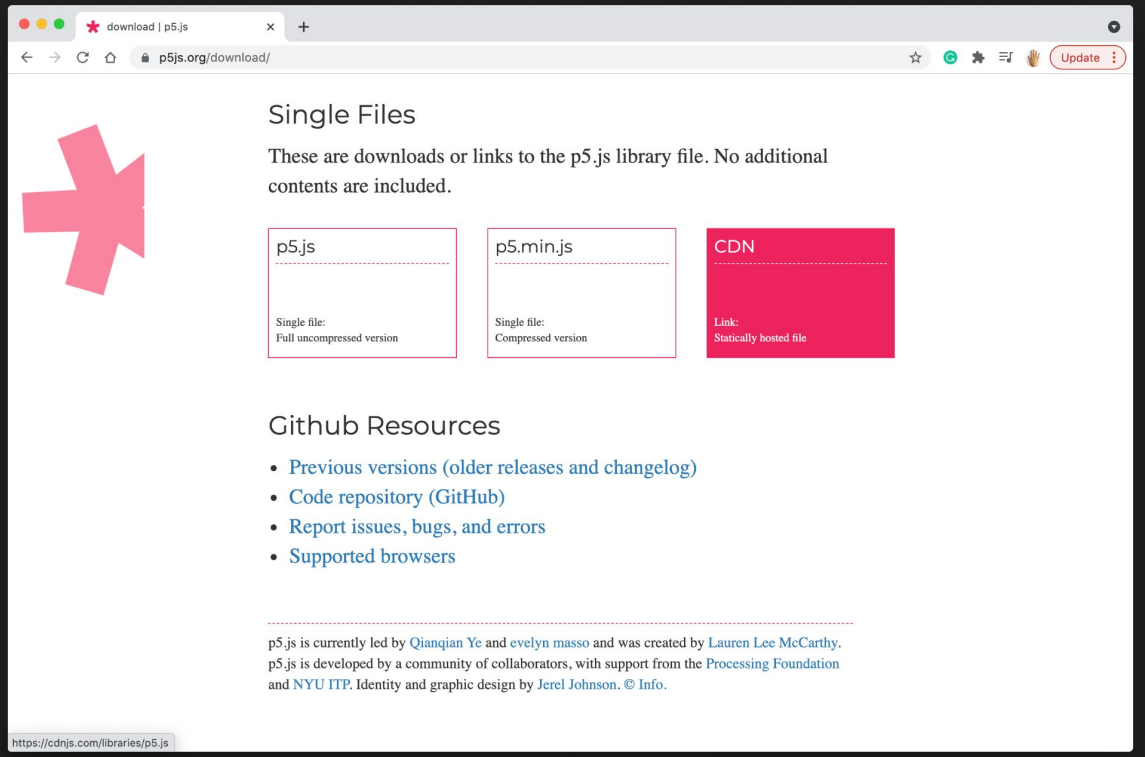
Using p5.js library: <script> tag

Scroll down to the Single Files section on the download page.

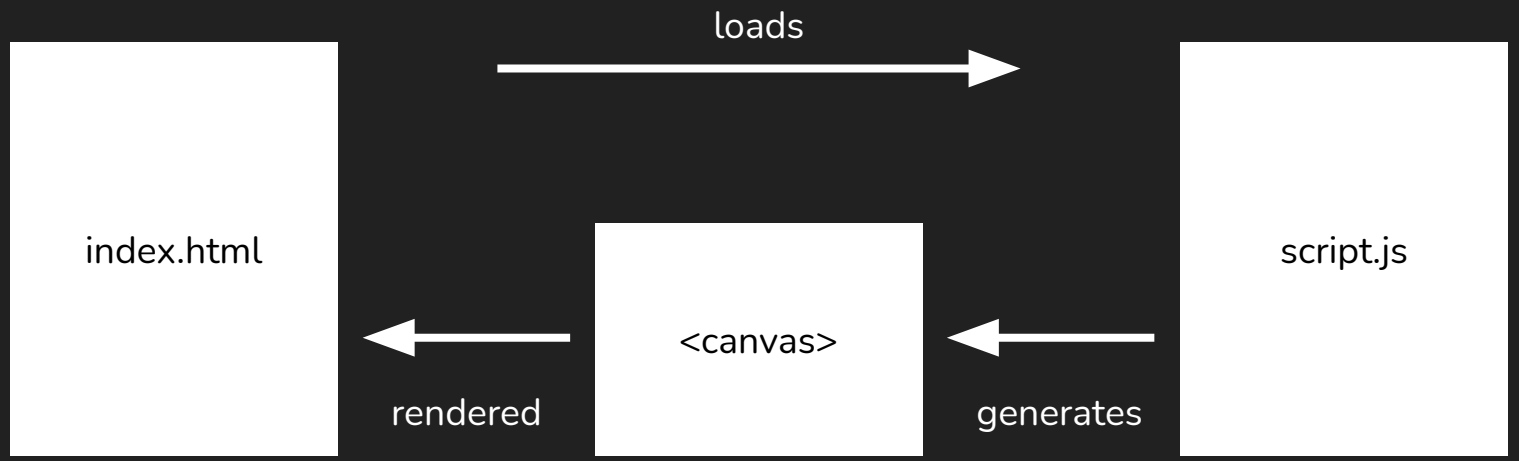
Click on the CDN button.

Copy-paste the <script> tag for the p5.min.js library.

Insert <script> tag in <head> section of your HTML document.



Anatomy of p5.js Projects



setup()

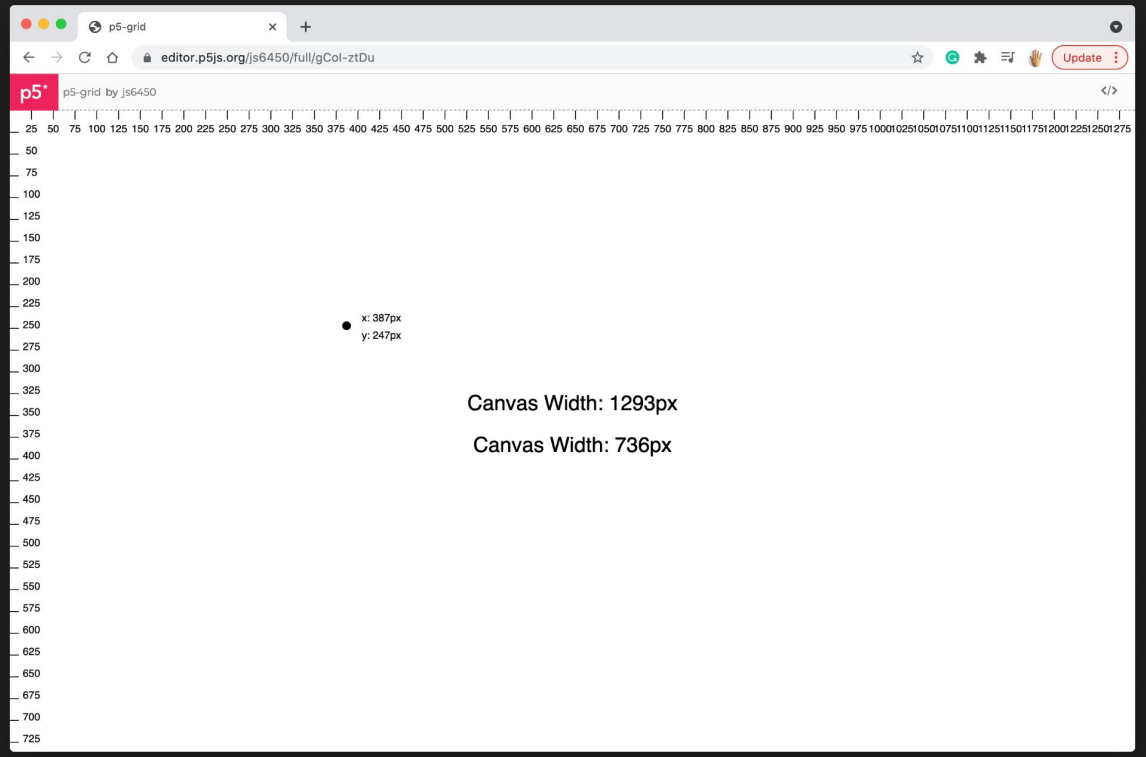
```
function setup(){
    // a built-in p5.js function
    // used to set the sketch's initial state when the sketch begins
    // is not explicitly called
    // runs only once
    // commonly used functions: createCanvas(), background()
}
```

draw()

```
function draw(){
    // a built-in p5.js function
    // runs after setup() function
    // is not explicitly called
    // repeatedly executes in an infinite draw loop
}
```

Coordinate System

The canvas uses a two-dimensional grid with ordered pairs.



Shapes

point(x, y)

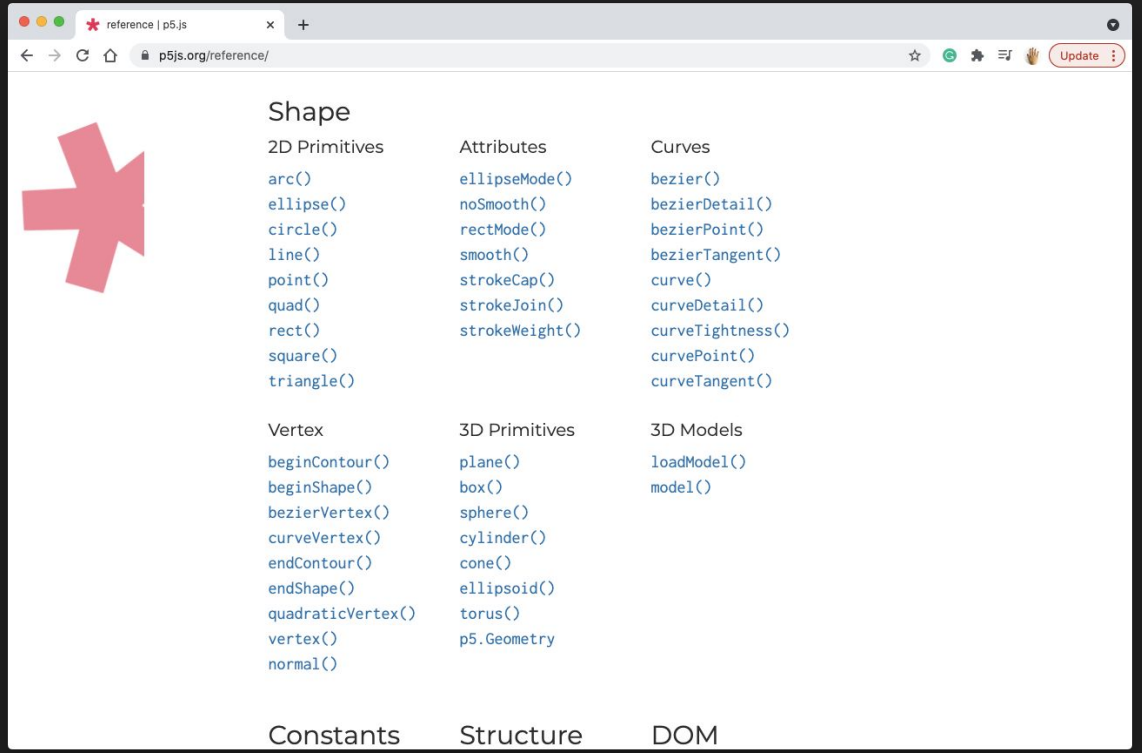
line(x, y)

square(x, y, size), rect(x, y, w, h)

circle(x, y, size), ellipse(x, y, w, h)

triangle(x1, y1, x2, y2, x3, y3)

quad(x1, y1, x2, y2, x3, y3, x4, y4)



Styling

background(color)

fill(color), noFill()

stroke(color), noStroke()

Colors

Grayscale:

```
background(51);
```

RGB:

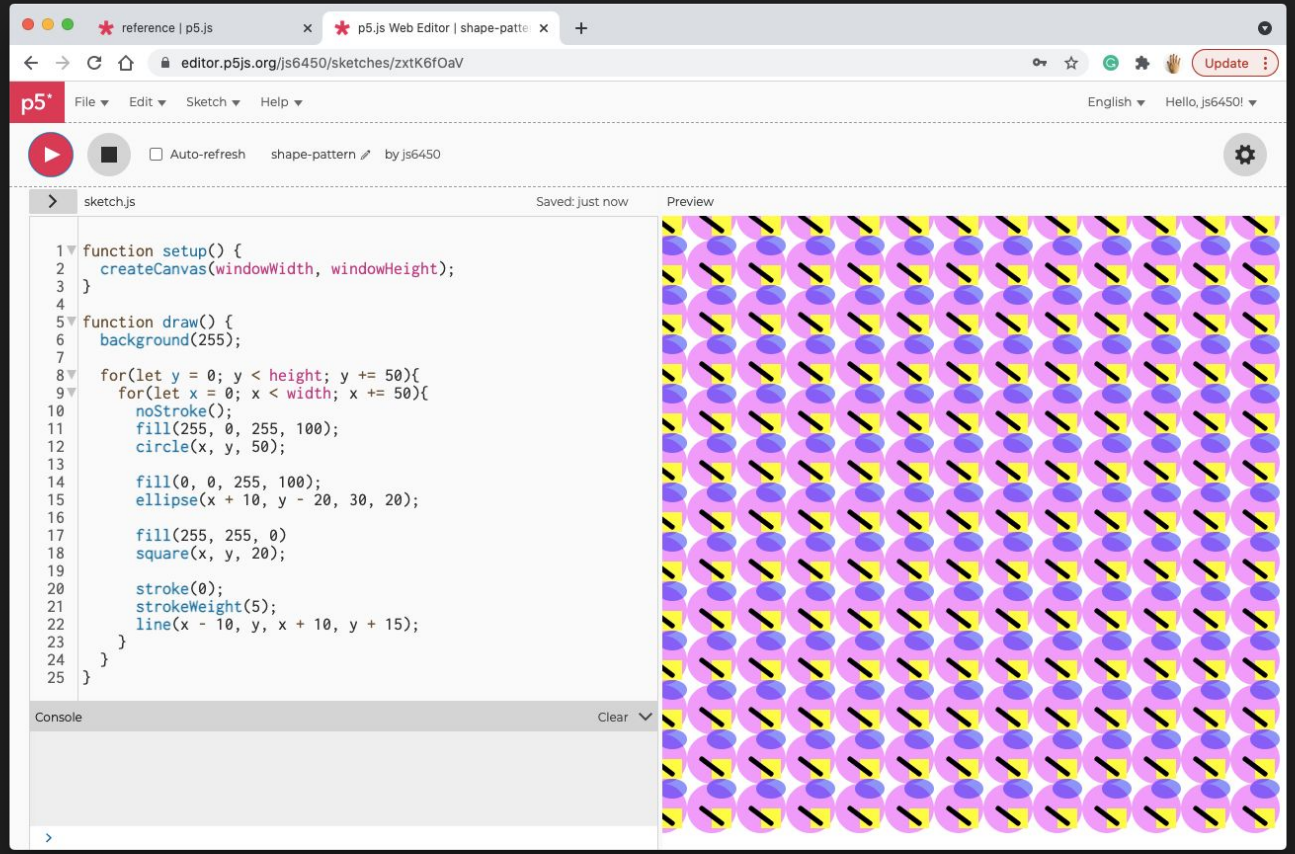
```
background(255, 204, 0);
```

Named CSS color string:

```
background('red');
```

Hexadecimal:

```
background('#ffaaee');
```



[Grid of Shapes]

Making things move!

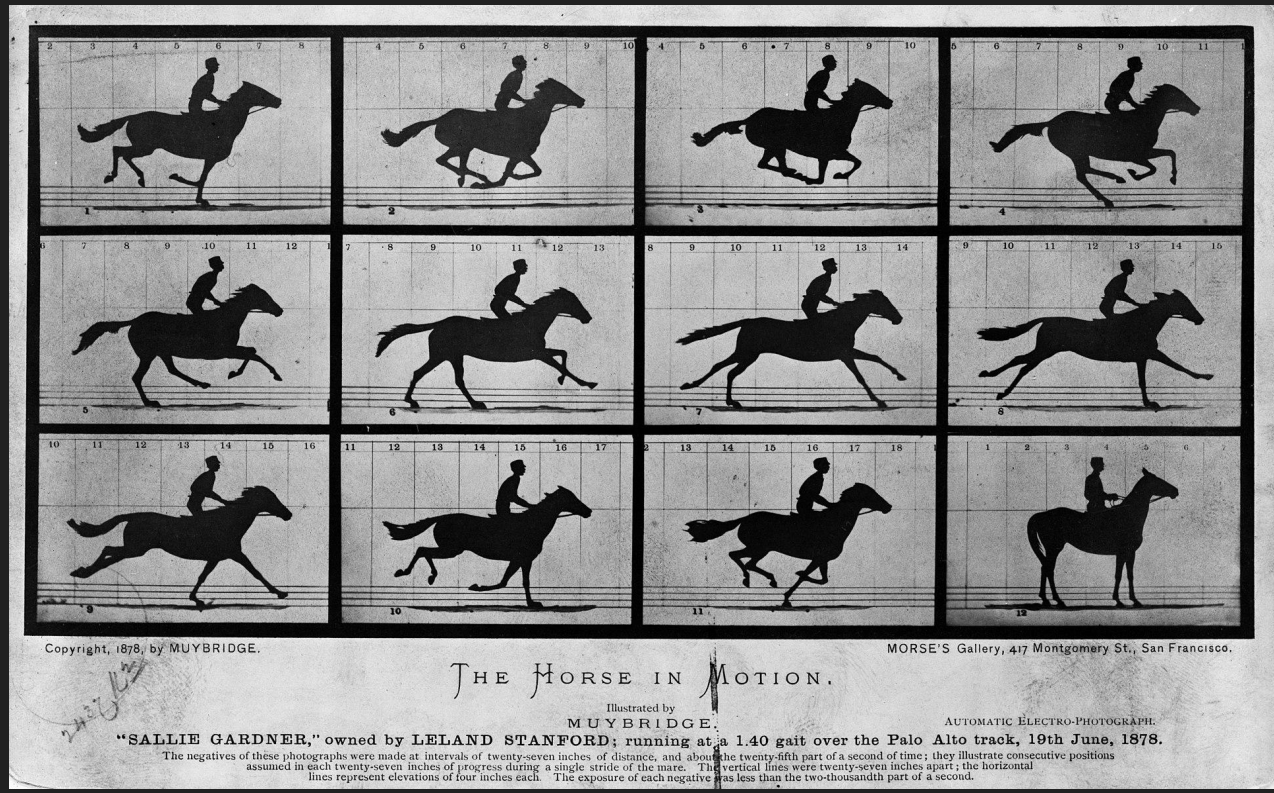
Frames

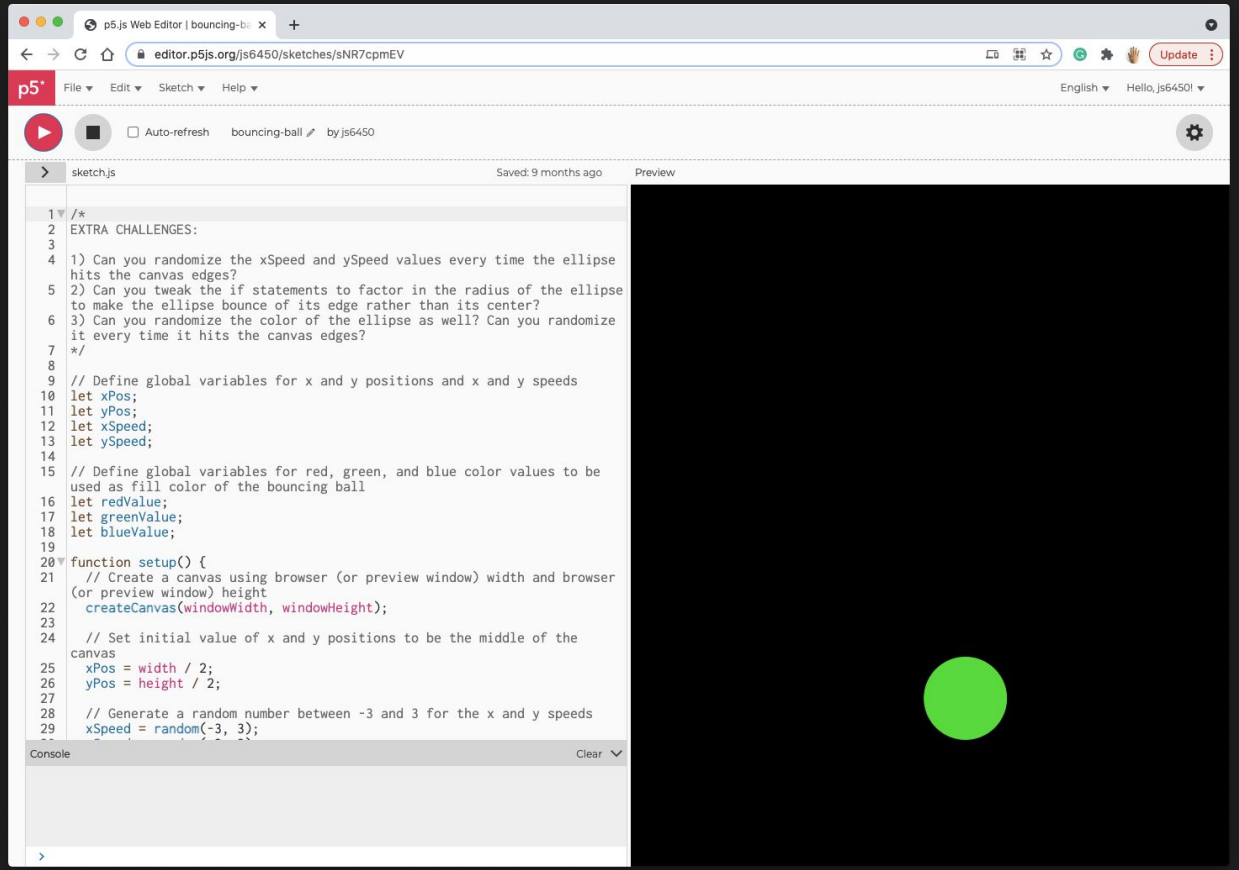
Individual pictures in a sequence of images.

When multiple frames are shown at a fast enough rate, our eyes translate and blend them into a single moving image.

In p5.js, we use the draw() loop

→ one draw() loop = 1 frame





[Bouncing Ball]

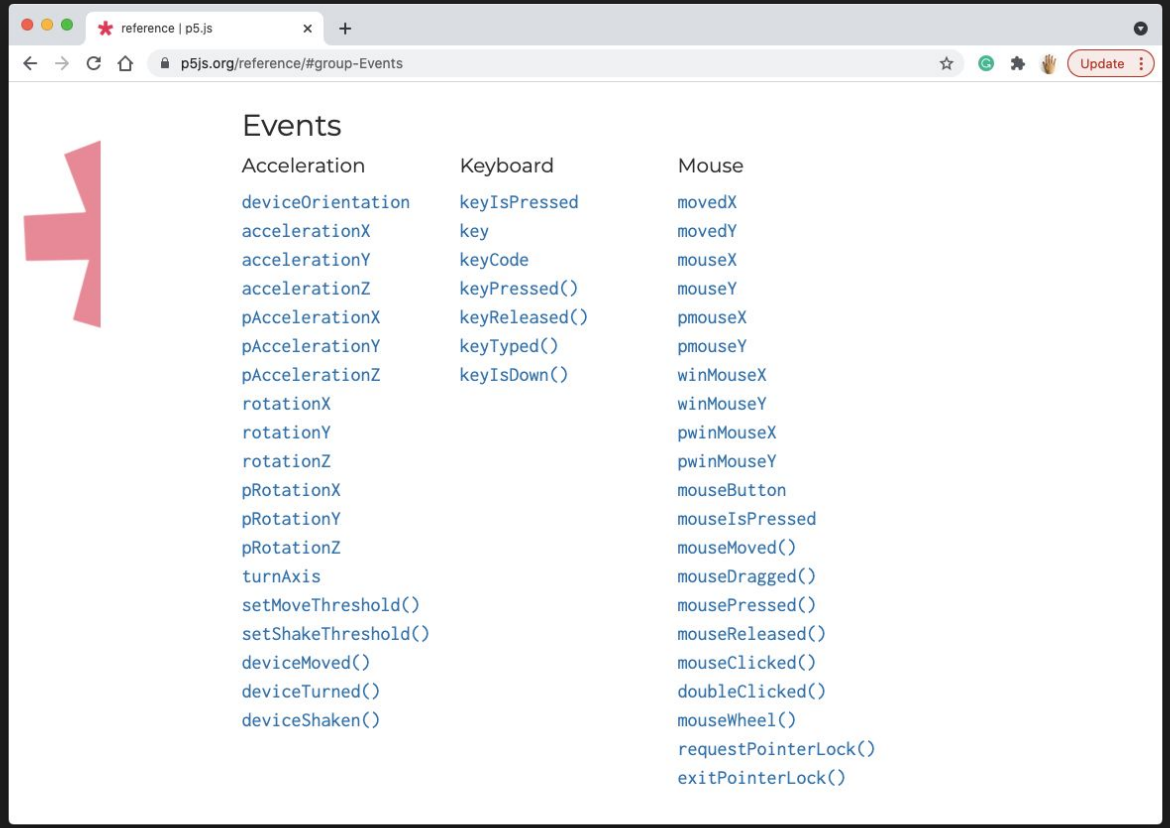
Random vs Noise

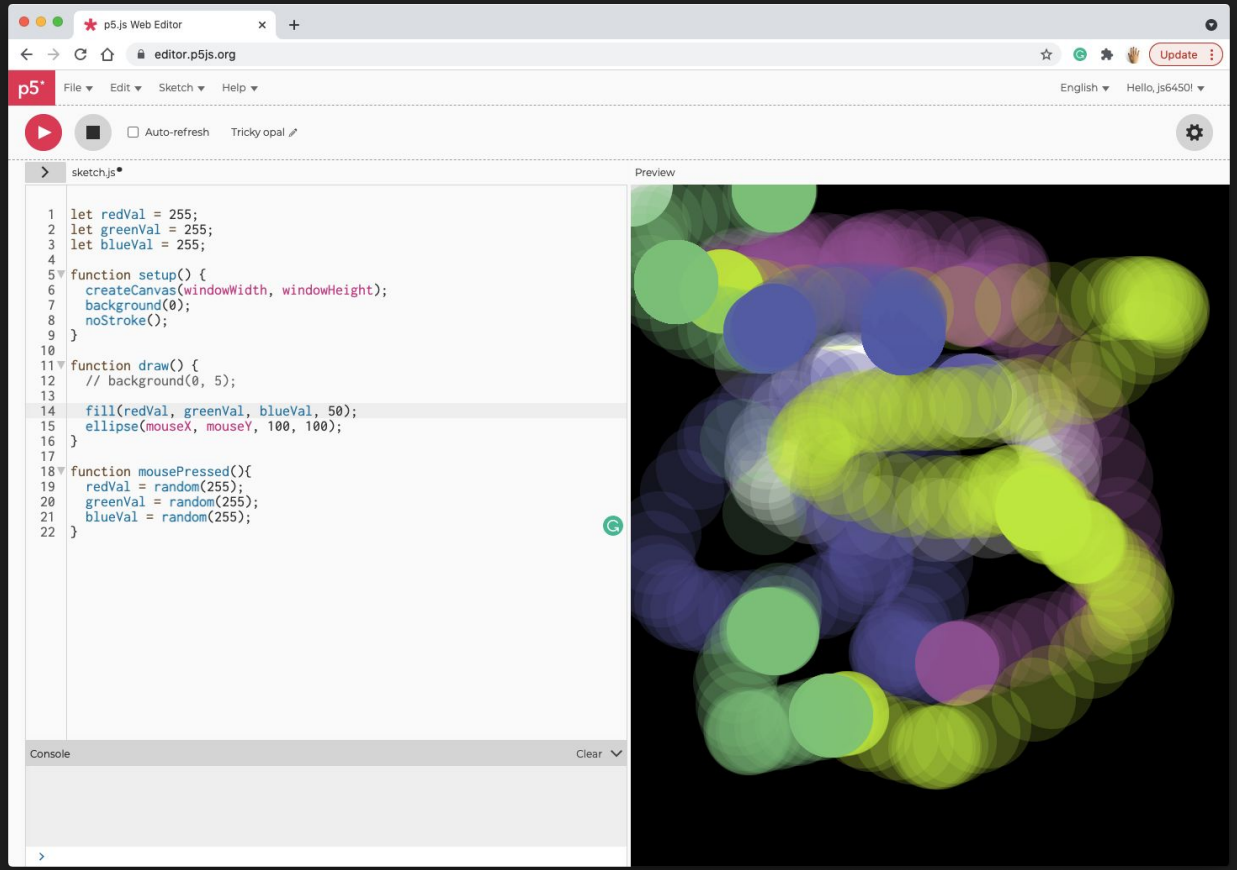
Adding interactivity!

Events

p5.js built-in variables and functions for detecting user events

- Mouse
- Keyboard
- (mobile) device orientation
- (mobile) acceleration
- (mobile) rotation





[Simple Drawing Tool]

Resources

GitHub repo with code from workshop

p5.js reference page

Codecademy's Learn p5.js Course

Daniel Shiffman's Coding Train

Make: Getting Started with p5.js

Generative Design