Let’s say you needed a website that could remind someone to take their daily medication. You would need a calendar of sorts… Now you could code your own calendar… or…

Unit 7 - Lesson 5
Libraries Explore

Vocabulary

Library: a group of functions (procedures) that may be used in creating new programs. Think of it like your coding toolbox that you can borrow from someone else. : e.g. Bootstrap

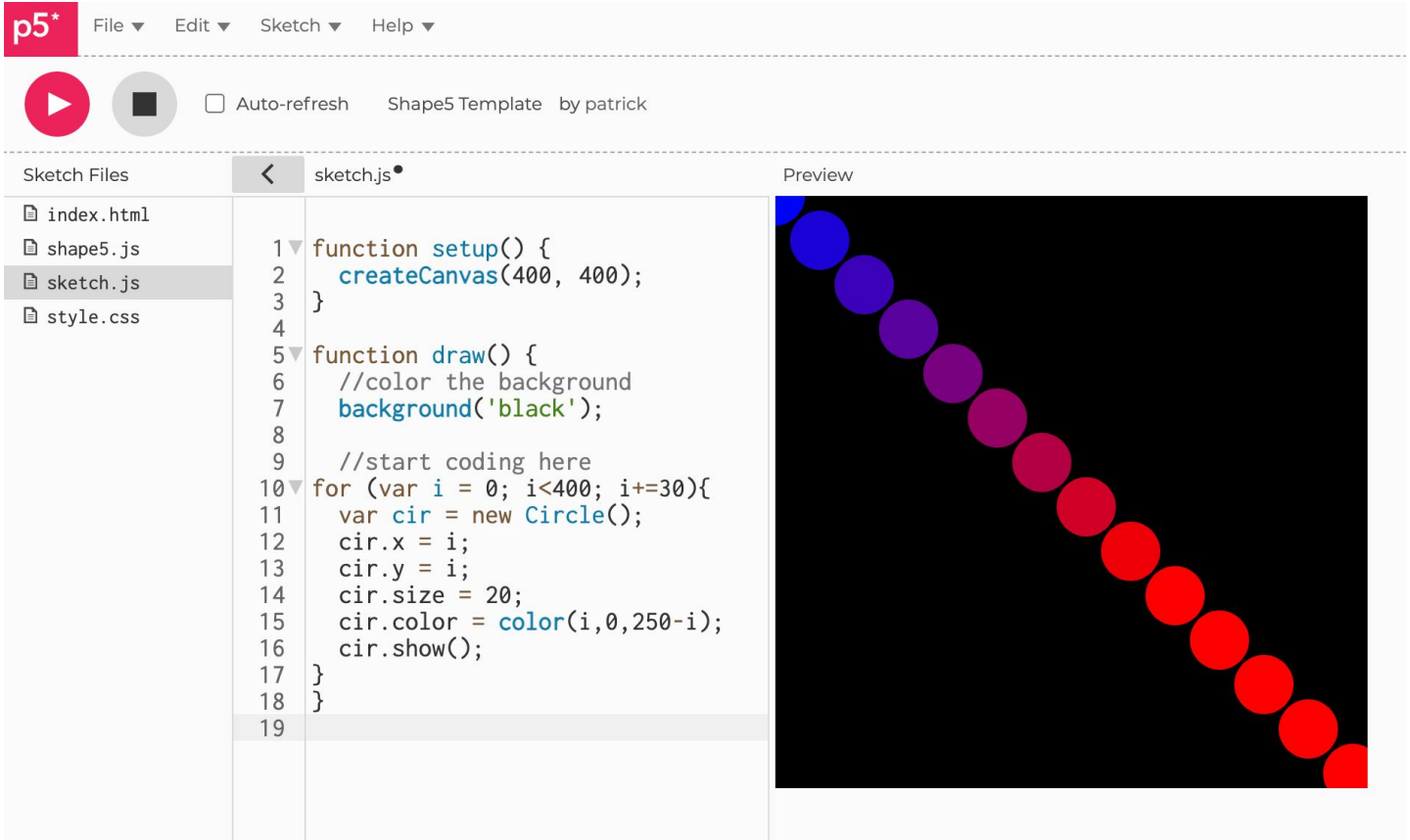
API: Application Program Interface - specifications for how functions in a library behave and can be used (instruction manual)

Why it works: Procedural Abstraction:

Procedural Abstraction provides a name for a process and allows the procedure (function) to be used only knowing what it does, and not necessarily how it does it.

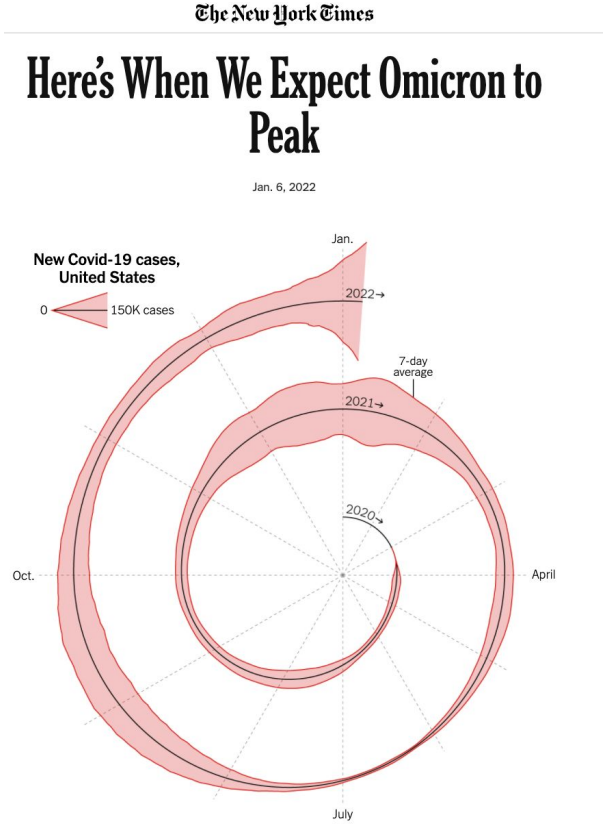
Modularity - the subdivision of a computer program into separate subprograms.

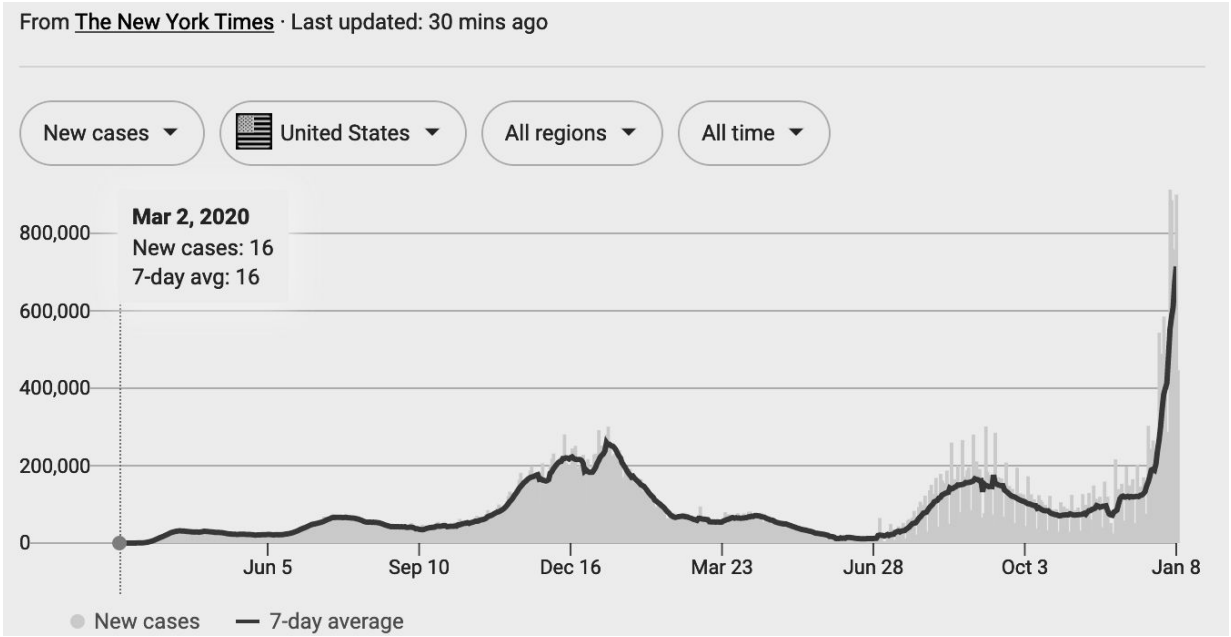
Libraries Introduction Lab



Examples:

Sidenote: the importance of data visualization





Plotly.js

Easy to use javascript library to create tables and charts
https://plotly.com/javascript/

Build your first graph by

1. Setting up a new html file
2. Code a long!

```
<head>
    <script src='https://cdn.plot.ly/plotly-2.8.3.min.js'></script>
</head>

<body>
    <div id='myDiv'></div>
<script>
var trace1 = {
  x: [1, 2, 3, 4],
  y: [10, 15, 13, 17],
  type: 'scatter'
};
var data = [trace1];

Plotly.newPlot('myDiv', data);

  </script>
</body>
```

Let's comment this code!

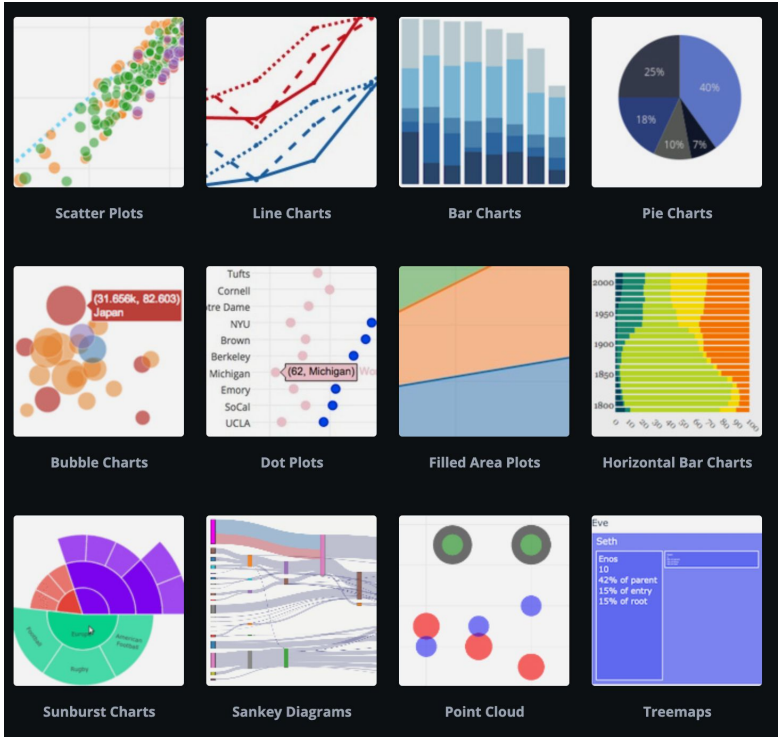
Explore Plotly

- What kind of graphs are available?
- Why is this library helpful?

Practice with Plotly

What kind of graph is best?

1. Birthdays by month
2. Average global temp by year
3. Percentage of seniors, juniors, and sophomores in this class

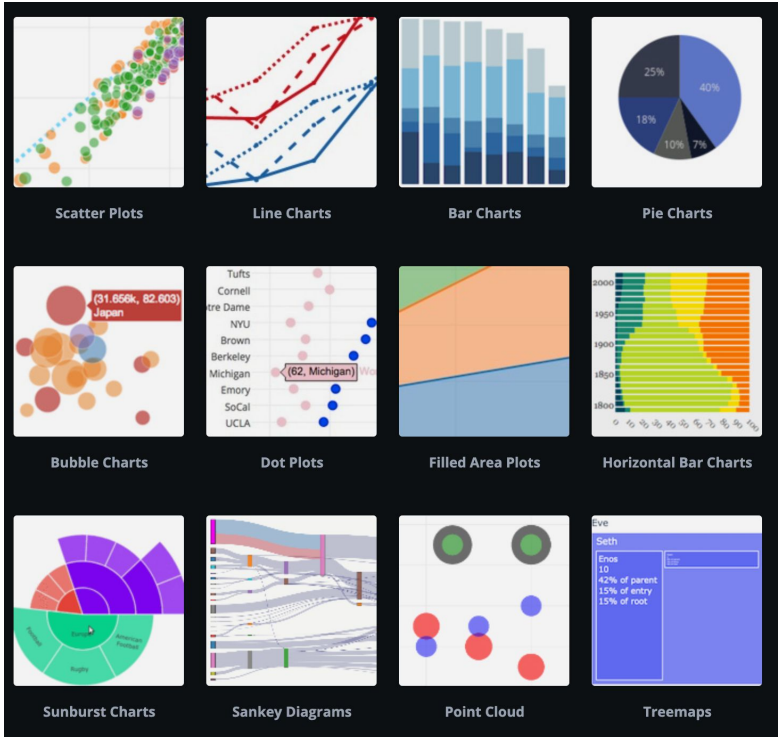


Practice with Plotly

Answer this poll!
https://forms.gle/H3oeLrG54JoWkCHLA

Make the 3 graphs shown below as practice. Data here:

1. Birthdays by month
2. Average global temp by decade
3. Percentage of seniors, juniors, and sophomores in this class



How to add Labels…

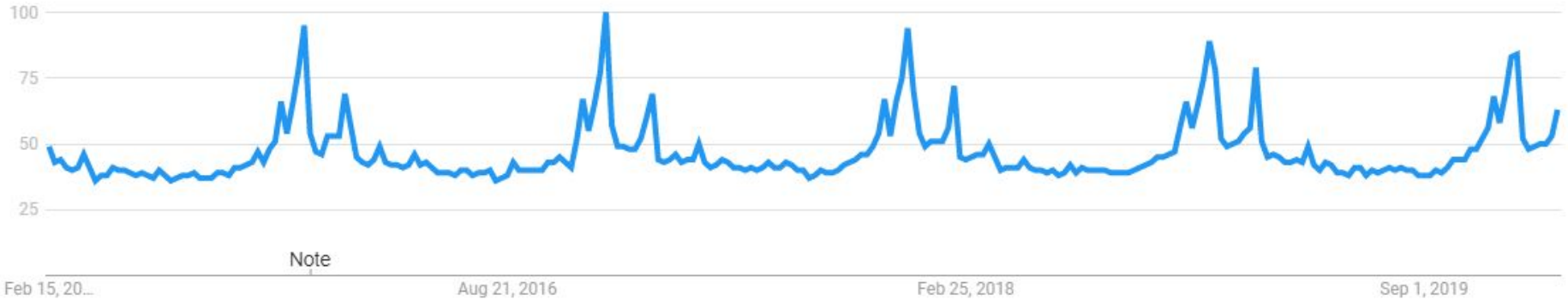
```
var data = [{
 x: ['jan',
'feb','mar','apr','may','june','july','aug','sept','oct','nov','dec'],
 y: [1, 4, 2, 2, 5, 3, 4, 2, 3, 2, 6, 1],
 type: 'bar'
}];

var layout = {
  title: "Birthdays by month",
  xaxis:{
    title: 'months'
  },
  yaxis:{
    title:"count"
  },
};

Plotly.newPlot('myDiv2', data, layout);
```

Prompt:

What time of year do people tend to search online for chocolate?

How could you check your guess?

Google Trends



Searches for chocolate over the past 5 years.

Prompt: What pattern do you notice? What could be the reason for that pattern? What does the data tell you?

Let's explore Google Trends together!

https://www.google.com/trends/

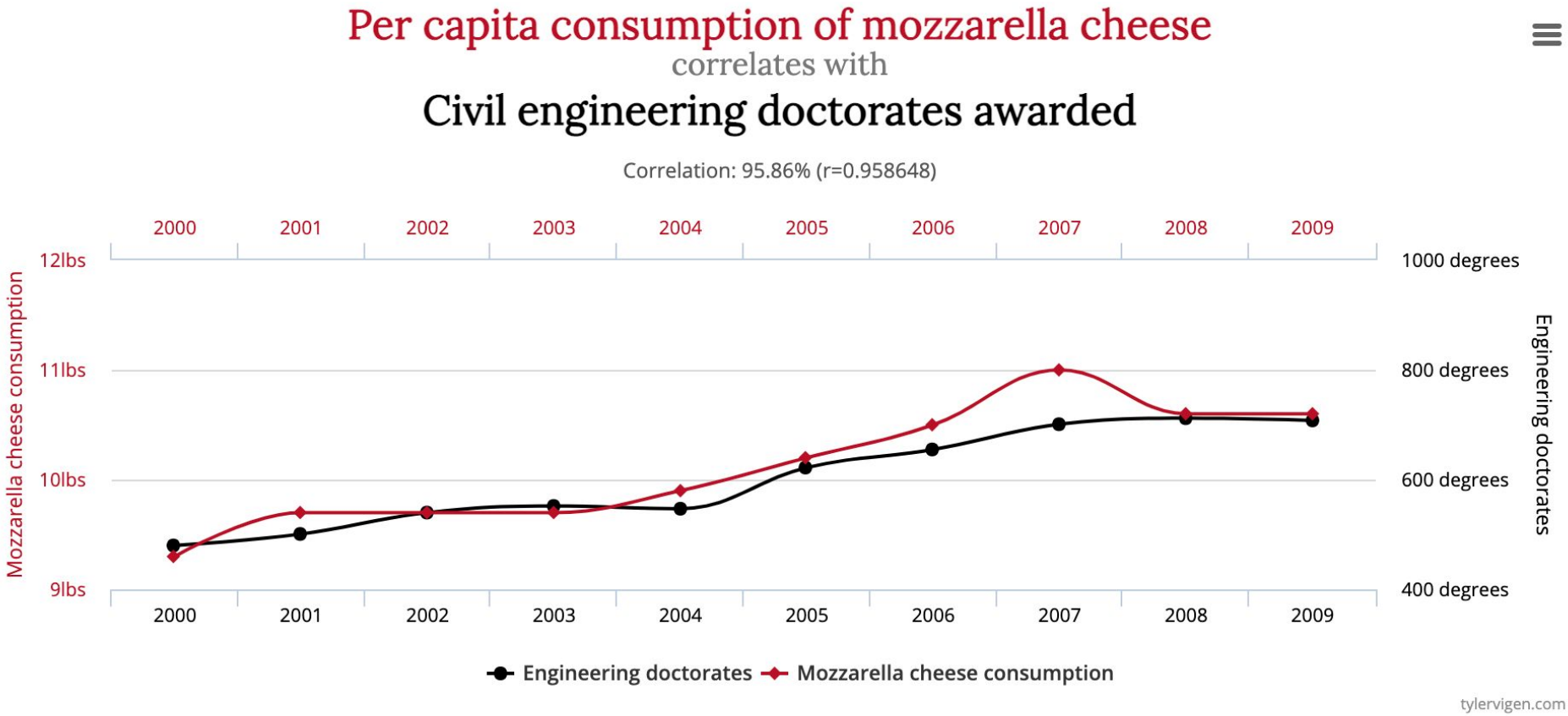
What can we do with this tool?

- Add search items (one or more - we can compare graphs)
- Control location, time, search category, and more!
- Look for patterns in the data

Do This:

- With a partner, look for a "data story".
- Try different search items and play with the drop downs to focus on a particular location or time period.
- What interesting things do you uncover?
- What questions can you answer with your charts?
- Define the **what** (facts) and **why** (opinions).

similarities, patterns **Correlation =! Causation** this thing caused that thing



Data sources: U.S. Department of Agriculture and National Science Foundation

In this unit, we will be making charts to help answer questions:

- *"I think this visualization tells me this..."*
  - Something is more popular than something else
  - Something is more important than something else
  - Something has become more or less searched over time

- *"... but I'm not sure because..."*
  - I don't know exactly how the data was collected
  - This might tell me people searched for green more than red, but it doesn't tell me why they do that or that green is a better color
  - We need more data!

Deliverable: A Plotly Data Presentation

- Not an actual presentation
- Goal: Using Plotly, create a webpage that graphs information about a topic you are interested in. This could be related to...
    - College acceptances
    - Sports statistics
    - Health Statistics
  - These stats can come from any reputable source. E.g. for sports stats, espn, for college stats, College Board, etc.
  - Data set must have x-axis and y-axis (x-axis is probably going to be time)
  - Answer the following questions on your HTML webpage formatted nicely

1. What kind of story is the data saying?
2. What interesting things do you uncover?
3. What questions can you answer with your charts?/
4. What kind of conclusions can you make from your graph
5. Citation of your resources

- Things to hand in:
  - Webpage screenshot
  - code