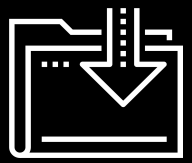
Citi Bike Leaflet and Introduction to Projects

Data Boot Camp

Lesson 17.3



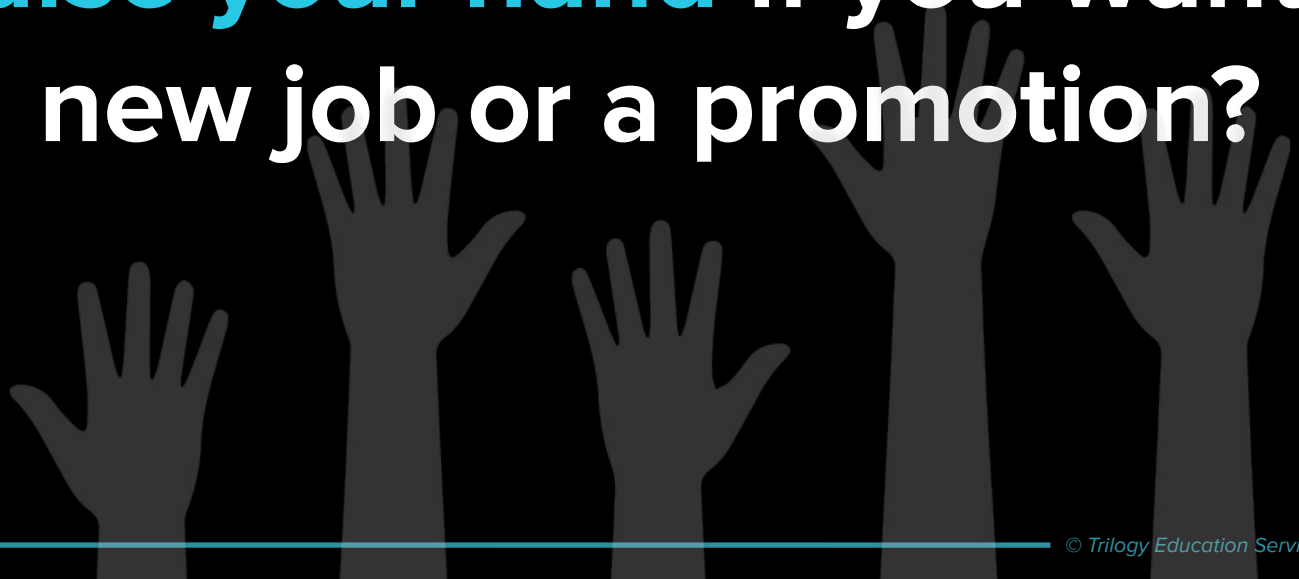
Class Objectives

By the end of today's class you will be able to:

- Gain a Leaflet mastery by completing an in-class project.
- Form project 2 teams and draft project 2 proposals.

UPCOMING CAREER SERVICES

Raise your hand if you want a new job or a promotion?



Why Discuss Career Services Now?

In the next few weeks, you will complete a Career Services Preferences survey on BootcampSpot

The options available:

Information about online career events and workshops

Access to JobTrack, a job search management tool

Feedback on your professional materials from your Profile Coach - Resume, Github, LinkedIn, etc.

1:1 scheduled career coaching sessions with your Career Director at least twice a month, OR a Career Director you can reach out to when you have questions

First Step: Becoming Employer Ready

You MUST HAVE polished professional materials to begin applying for jobs

REVIEW MILESTONE 1

Employer Ready vs. Employer Competitive for a refresher

Once you are Employer Ready, you'll unlock access to additional Career Services support

SMALL GROUP TECHNICAL INTERVIEW WORKSHOPS

Within one 90-minute session, 50% of students increase their scores by 50% on technical assessments.

JOB REFERRALS

We have a network of employers who regularly partner with us to hire tech talent. While we cannot guarantee a referral, you can only be referred when you are Employer Ready.

Introduction to Career Services

Working With Your Career Director

Your Career Director provides you with 1:1 coaching to help you be Employer Competitive in your job search.

Topics include: Applying, gaining traction to land interviews, conducting mock interviews, networking, salary negotiation, motivation and more!

YOU HAVE TWO OPTIONS

1. 1:1 scheduled bi-monthly recurring coaching calls
2. Reaching out to your Career Director when needed

We recommend scheduled Recurring Calls - Why?

The data shows that our students who are Employer Ready and participate in recurring calls are MUCH MORE LIKELY to secure the jobs they want

Career Services Next Steps

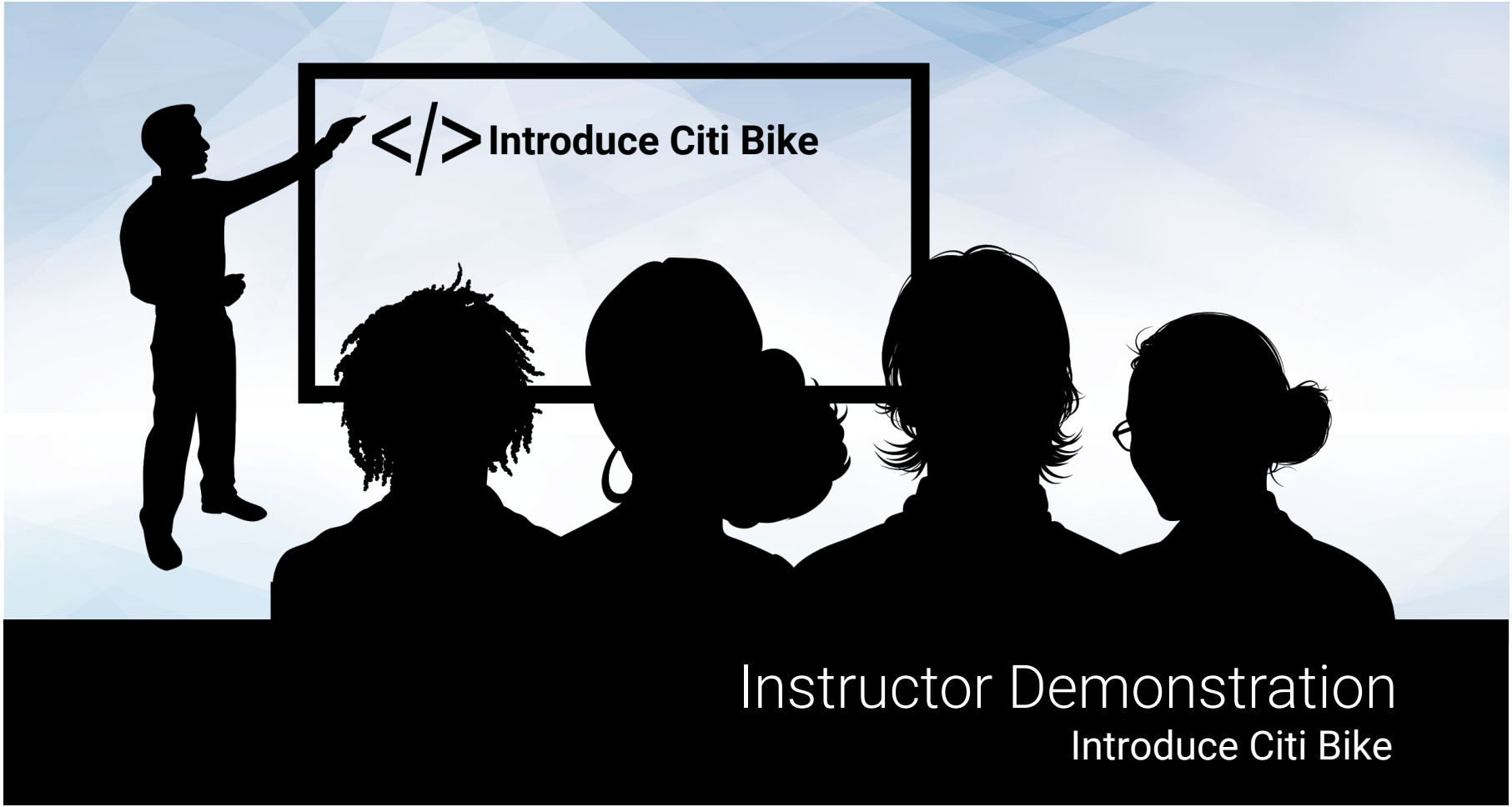
1. **Visit the Career Services page on BootcampSpot for resources on developing your Employer Ready professional materials**

   Submit your professional materials for review. You'll receive feedback from your Profile Coach within 5 days.

2. **Be on the lookout for an email from your Career Director inviting you to schedule your first coaching call in the next few weeks**

   Ready to meet with your Career Director now? They've sent you multiple emails throughout the course - respond to an email to get connected!

3. **Register for Career Service events and workshops**

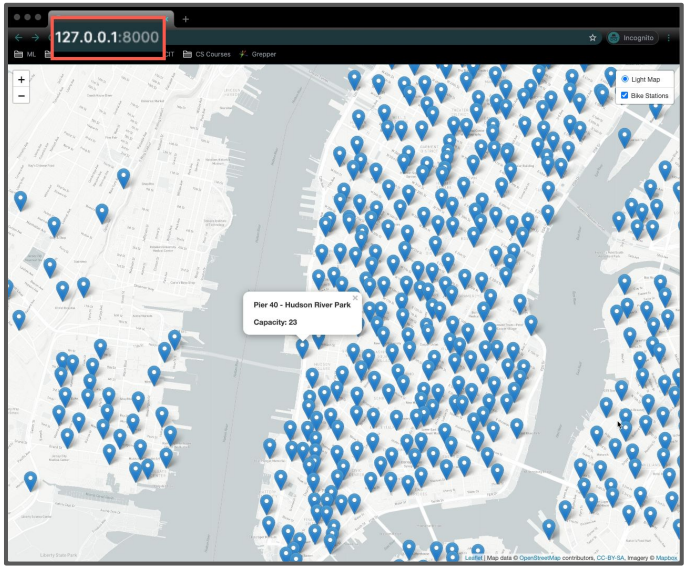


Instructor Demonstration

Introduce Citi Bike

Introduce Citi Bike

Basic Version:



➔ Citi Bike API Station Information Endpoint.

```
d3.json("https://gbfs.citibikenyc.com/gbfs/en/station_information.json", createMarkers);
```

➔ One kvp (key value property) of the json.

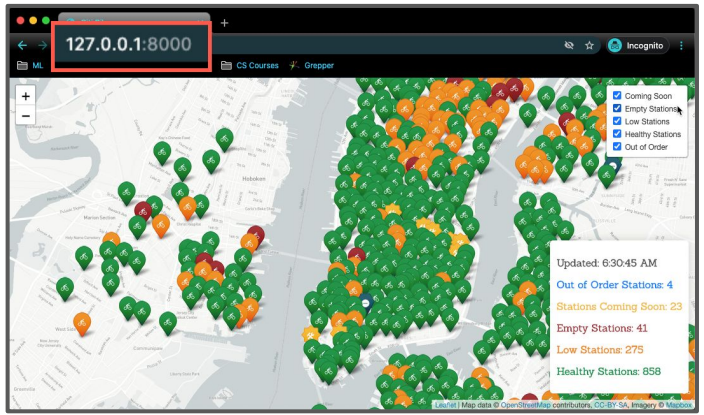

```
{"stations":[
    {"station_type":"classic",
    "lon":-73.99392888,
    "region_id":"71",
    "lat":40.76727216,
    "rental_url":"http://app.citibikenyc.com/S6Lr/IBV092JufD?station_id=72",
    "name":"W 52 St & 11 Ave",
    "short_name":"6926.01",
    "rental_methods":["CREDITCARD","KEY"],
    "electric_bike_surcharge_waiver":false,
    "external_id":"66db237e-0aca-11e7-82f6-3863bb44ef7c",
    "eighthd_station_services":[],
    "capacity":55,"has_kiosk":true,
    "legacy_id":"72",
    "station_id":"72",
    "eighthd_has_key_dispenser":false}
]}
```


- Each marker is placed at the latitude and longitude returned by request.
- When a marker is clicked, a popup appears displaying the station name and capacity.
- These responses includes: `name`, `station` and `capacity` of each station.

Introduce Citi Bike

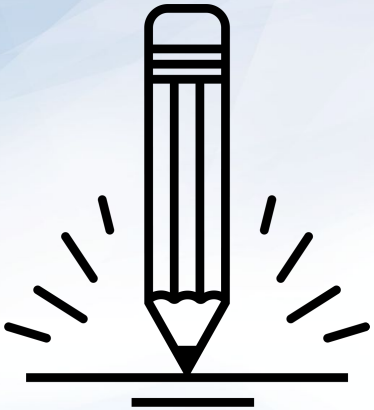
Advance Version:

➔ Citi Bike API Station Information + Status Endpoint.




```
d3.json("https://gbfs.citibikenyc.com/gbfs/en/station_information.json", function(infoRes) {
 d3.json("https://gbfs.citibikenyc.com/gbfs/en/station_status.json", function(statusRes) {
   var updatedAt = infoRes.last_updated;
   var stationStatus = statusRes.data.stations;
   var stationInfo = infoRes.data.stations;
   var stationCount = {
     COMING_SOON: 0,
     EMPTY: 0,
     LOW: 0,
     NORMAL: 0,
     OUT_OF_ORDER: 0
   };
```

- This version groups markers into layers according to station status.
- When a marker is clicked, a popup appears displaying the station name, capacity and bikes available.
- These responses includes: `name`, `station` and `capacity` of each station.



Groups Do: Citi Bike

In this activity, you and your group will work with the Citi API to build a map of all the Citi Bike stations and their status.

Suggested Time:
30 Minutes

Group Do: Citi Bike

Basic Version Instructions:

- Use the Citi Bike Station Information Endpoint to retrieve information about station names and locations. Take a moment to study the data sent back by the endpoint in your browser.
  - Each object in the `stations` array has `station_id`, `name`, `capacity`, `lat`, and `lon` properties.
  - The `logic.js` file in the skeleton folder contains coordinates that can be used to position a Leaflet map over New York City.
- Create a function called `createMap` that will take in `bikestations` as an argument. This function will create both the tile layer and an overlay layer with the pins for each station.
- Create a second function `createMarkers` that will take `response` as an argument.
  - Using the response from a future d3 call loop through the stations and create a marker to represent each station.
  - Give each marker a popup to display the name and capacity of its station.
- In the `createMarkers` function pass the result the bike makers into the the `createmap` function as an `layerGroup`.
- Perform a GET request using D3 to the Citi Bike Station Information Endpoint that will call the `createMarkers` function.
  - Remember to pass in your unique Mapbox token.

Group Do: Citi Bike

Advanced Version Instructions:

After completing the Basic Version, write code to complete as much of the Advanced Version as possible.

- Write code to perform a second API call to the Citi Bike Station Status Endpoint. Take a few moments to study the data being returned. In particular we are concerned with the `station_id`, `num_bikes_available`, `is_installed`, and `is_renting`.
- Using the data retrieved from the second API call, try to add the following functionality:
  - Display the number of bikes available inside the popup for each marker.
  - Add a layer control and split the markers up into the following overlay layers:
    - Coming Soon: If a station is not installed.
    - Empty Stations: If a station has no bikes available.
    - Out of Order: If a station is installed but not renting.
    - Low Stations: If a station has less than 5 bikes available.
    - Healthy Stations: If a marker does not fall into any of the previous layer groups.
  - Utilize a Leaflet plugin to create different types of markers to represent each layer. For instance Leaflet.extra-markers, but you are free to use another plugin if you prefer.
  - Add a legend to your map to explain the different markers.
  - Deploy the app to Github Pages when complete.

Group Do: Citi Bike

- **Hints:**
  - 
    Make sure that you are running `python -m http.server` in the folder where your files are located. Since all the work is being done on the front end of your application, there will be no need to restart the router for changes made.
  - Some helpful links:
    - Leaflet Usage Example
    - Citi Bike Station Information API EndPoint
    - Leaflet Popup Doc
    - Citi Bike Station Status API EndPoint
    - Leaflet Layer Groups Doc
    - Leaflet Extra Markers
    - Leaflet Legend Doc

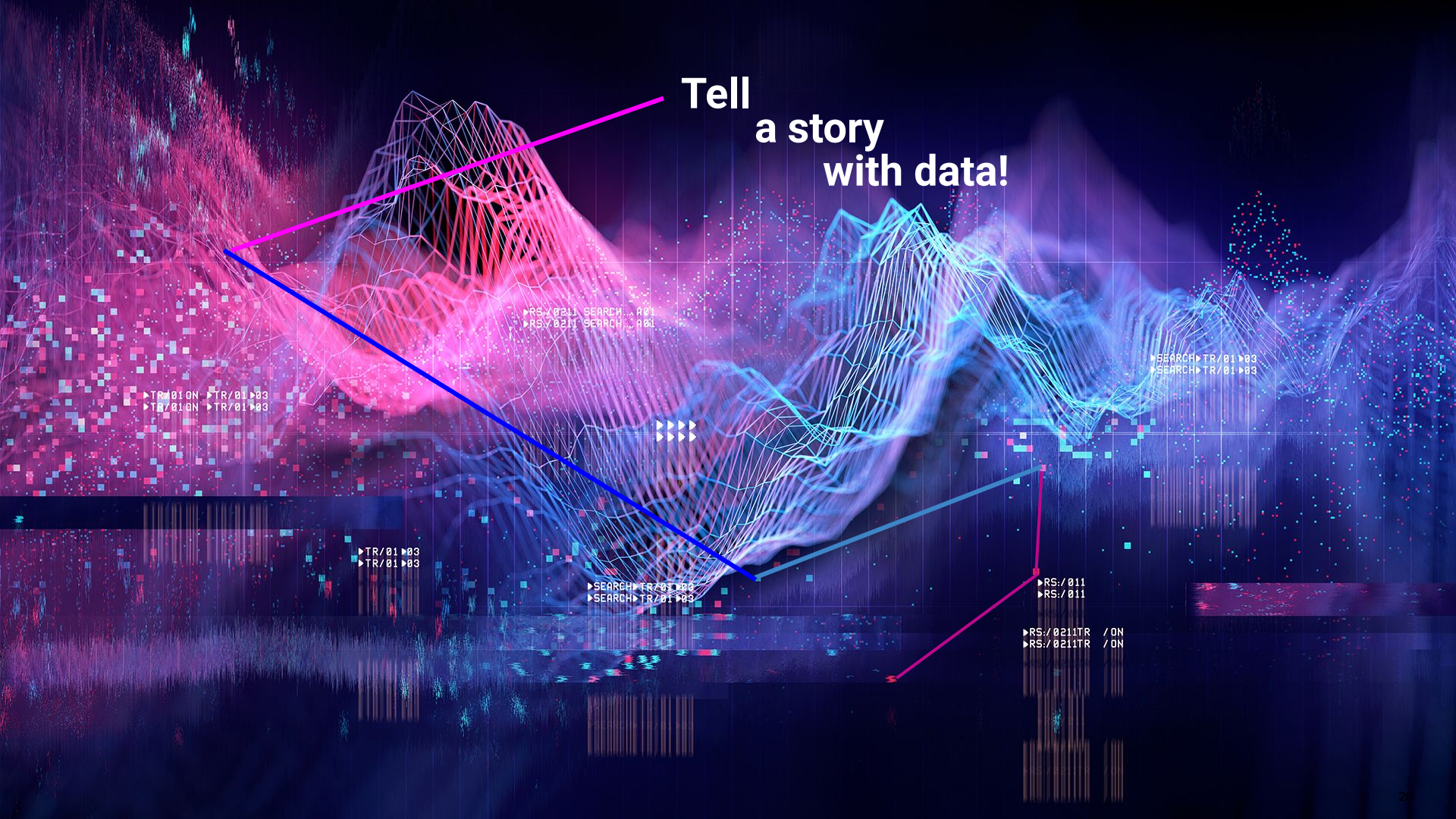
Time’s Up! Let’s Review.

Countdown timer

40:00

(with alarm)

➔ Project 2: Visualize Me, Captain!


Tell
a story
with data!

Project Requirements

Project Description

01 Your task is to **tell a story** with data visualizations.

02 Focus on providing users an **interactive means** to explore data themselves.

03 Prepare a **10-minute presentation** that lays out your theme, coding approach, data munging techniques, and final visualization.

04 You may choose a project of any theme, but we encourage you to **think broadly**.

05 You will have **ample time in class** to work with your group, but expect to put in **hours outside of class** as well.

Specific Requirements

1. Your visualization must include a Python Flask–powered API, HTML/CSS, JavaScript, and at least one database (SQL, MongoDB, SQLite, etc.).
2. Your project should fall into one of the below four tracks:
    - A custom “creative” D3.js project (i.e., a nonstandard graph or chart)
    - A combination of web scraping and Leaflet or Plotly
    - A dashboard page with multiple charts that update from the same data
    - A “thick” server that performs multiple manipulations on data in a database prior to visualization (**must be approved**)
3. Your project should include at least one JS library that we did not cover.
4. Your project must be powered by a data set with at least 100 records.
5. Your project must include some level of user-driven interaction (e.g., menus, dropdowns, textboxes).
6. Your final visualization should ideally include at least three views.

Schedule

Weekly Schedule

Day 1 (Today):
Between now and Thursday, you will need to start brainstorming topics with your group and researching potential data sets. Your focus should center around:

- Selecting a topic
- Finding a data set
- Finding inspiration
- “Sketching” your ideal visuals
- Creating a 1-page proposal

Day 2:
You will need to create a 1-page proposal that includes:

- A brief articulation of your chosen topic and rationale
- A link to your data set(s) and a screenshot of the metadata if it exists.
- 3 or 4 screenshots of relevant, “inspiring” visualizations that frame your creative fodder
- A sketch of the final design
- A link to the primary GitHub repository you’ll be housing your work in

Day 3:
Project Work

Final Thoughts

01

Project week is a great time to tie up loose ends, both with your group and on your own.

02

If there are topics you'd like to review, shoot me and the TAs a message. We're happy to do (recorded) extra review sessions for small groups during these weeks.

03

Good luck and have fun!

Questions?

Project 2

Kickstart