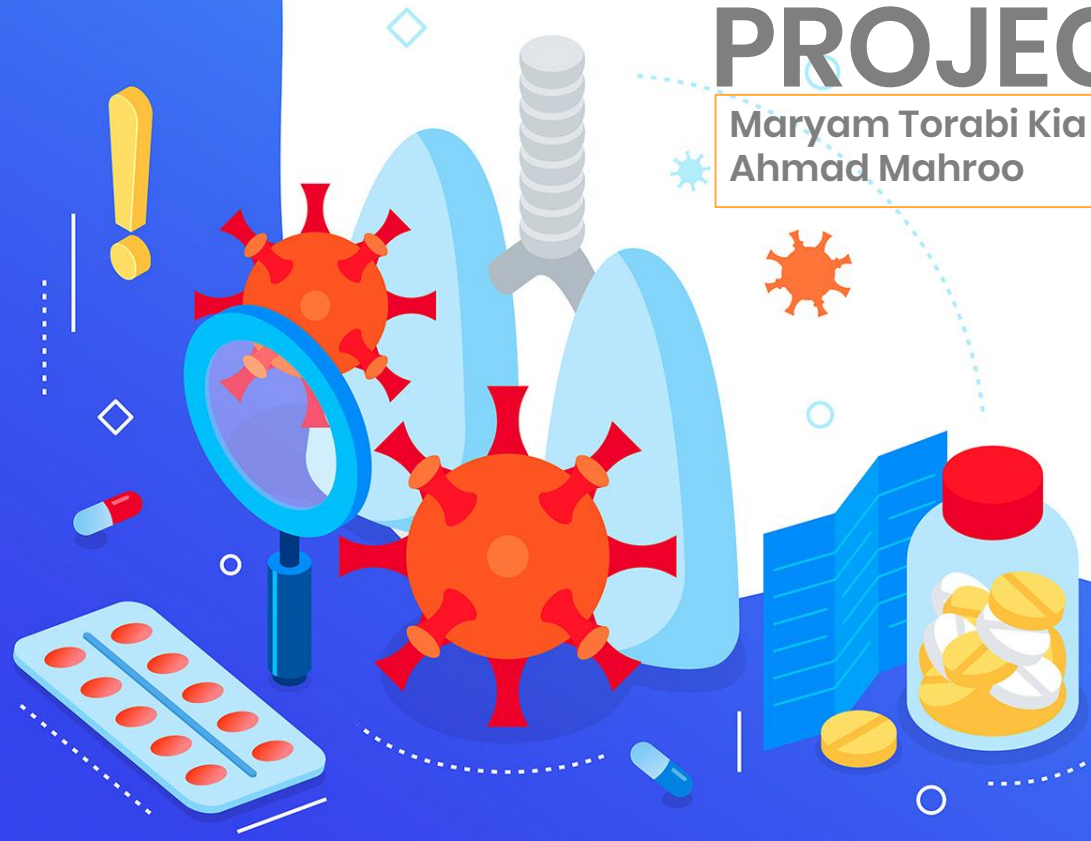
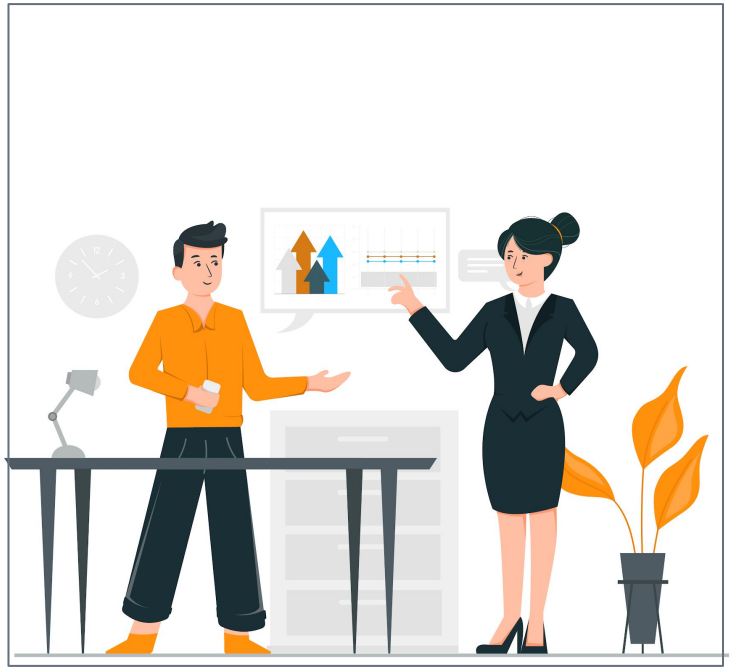
Covid Criminals PROJECT

Maryam Torabi Kia
Ahmad Mahroo

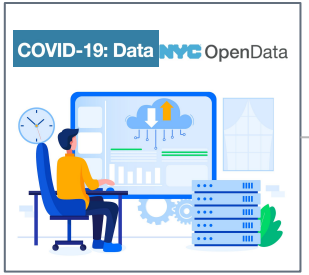


Welcome

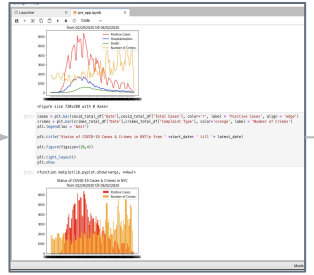
Let’s visualize the relationship between COVID-19 cases and criminal activities in New York City!



The project workflow in one glance

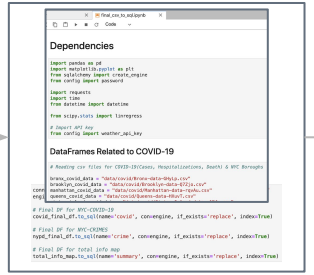


The Sources

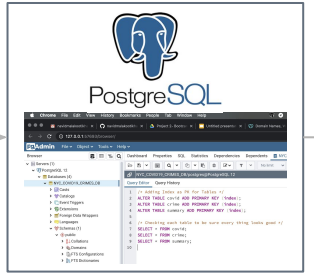


Preliminary Analysis

Front-end planning



ETL



ETL

Flask App

Java Script, HTML, CSS

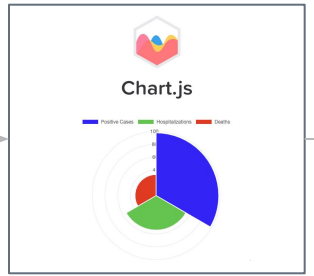


CHART.JS

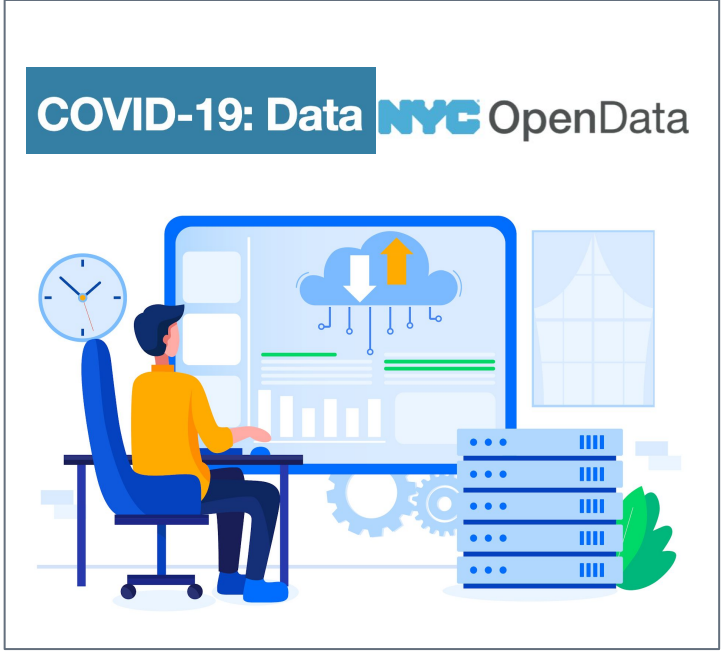
Final Application

Datasets

The Sources

Level of Difficulty

- All datasets are obtained from NYC open data sources.
- All data were available in CSV and JSON formats.



NYC Covid-19 Dataset Link:

https://www1.nyc.gov/site/doh/covid/covid-19-data-boroughs.page

NYC Crimes Dataset Link:

https://data.cityofnewyork.us/Social-Services/NYPD/fjn5-bxwg

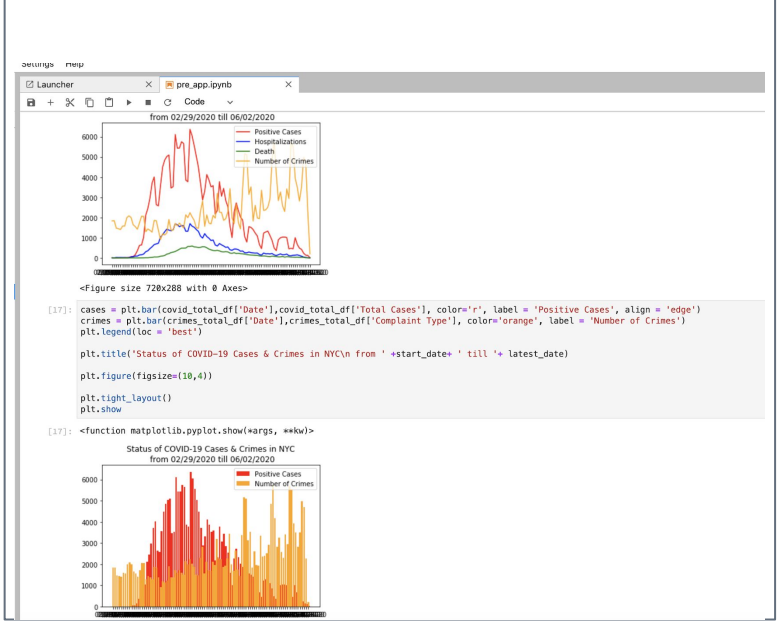
Why was it difficult?

It was challenging to find appropriate datasets that included all elements required such as Latitude and Longitude.

Jupyter

Preliminary Analysis

Level of Difficulty



What was done?

- Read CSV files.
- Removed unnecessary data.
- Merged rows, tables and columns.
- Grouped and aggregated.
- Preliminary plotting.

Why?

- Ensure our datasets are informative
- Preliminary clean up to plan ETL
- Initial plotting for early study

Design

Front-end planning

Level of Difficulty

What was done?

- Based on our datasets and plots, the expected front-end was sketched in Adobe Photoshop.

Why?

- Simplifying the output requirements, providing a layout for the wireframe of the HTML
- To have clear roadmap for expected results

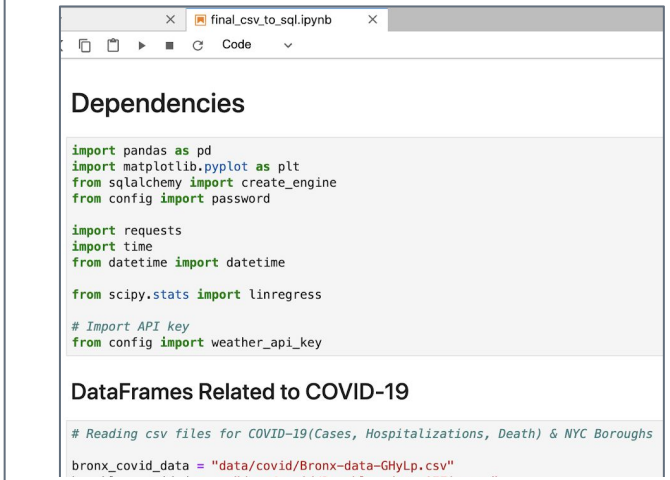
Jupyter

ETL

Level of Difficulty

What was done?

- Jupyter app was created to extract, transform and load data into PostgreSQL.




```
connection_string = f"postgres:{password}@localhost:5432/NYC_COVID19_CRIMES_DB"
engine = create_engine(f'postgresql://{connection_string}')

# Final DF for NYC-COVID-19
covid_final_df.to_sql(name='covid', con=engine, if_exists='replace', index=True)

# Final DF for NYC-CRIMES
nypd_final_df.to_sql(name='crime', con=engine, if_exists='replace', index=True)

# Final DF for total info map
total_info_map.to_sql(name='summary', con=engine, if_exists='replace', index=True)
```

Why?

- Data was required to be fed into SQL to further serve the front end application.

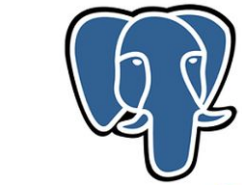
Why was it difficult?

- DataFrames were changed multiple times to obtain correct data structure and aggregated values.
- Indexing for loading to SQL.

PostgreSQL

ETL

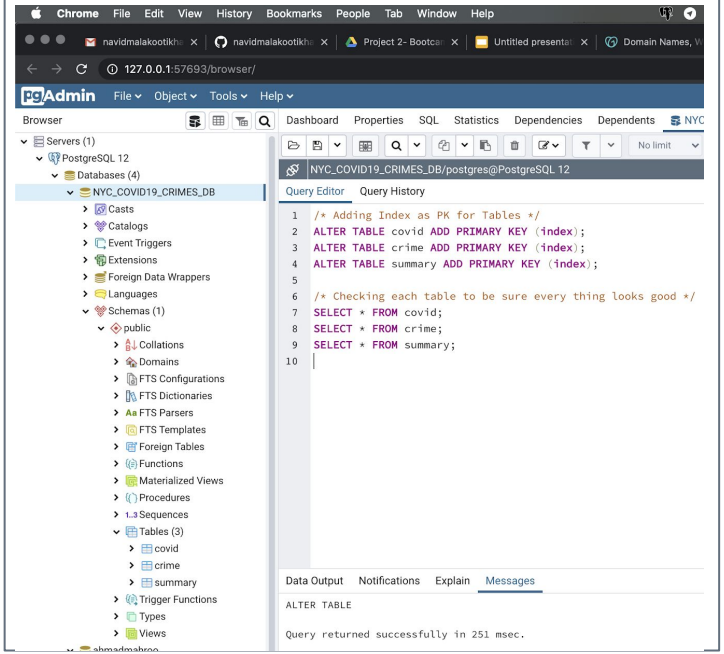
Level of Difficulty



PostgreSQL

What was done?

- Database was created.
- Data was loaded into SQL.
- Ran scripts to assign primary keys.



Why?

- To provide data to the Flask App.

Flask

Flask App

Level of Difficulty

Flask

web development,
one drop at a time

What was done?

- Googling and searching stack overflow to connect to Postgres
- Created API routes
- Provided JSON output data

app.py

UT-TOR-DATA-PT-01-2020-U-C > Project 02 > git > Project_2 > app.py > ...

```
import os
from flask import Flask, render_template, jsonify
from sqlalchemy import create_engine
import numpy as np
import sqlalchemy
from sqlalchemy.ext.automap import automap_base
from sqlalchemy.orm import Session
from sqlalchemy import create_engine, func
from config import password
from flask_cors import CORS


#Key Things, added a few line to jupyter lab
#in SQL everyone has to run the following to add primary key
#ALTER TABLE covid ADD PRIMARY KEY (index);
#ALTER TABLE crime ADD PRIMARY KEY (index);

################Navid added for Mapping
config = {
  'ORIGINS': [
    'http://localhost:5000',  # React
    'http://127.0.0.1:5000',  # React
  ],

  'SECRET_KEY': '...'
}
```

Why?

Provide a bridge between SQL data and the front-end. Flask was the data server.

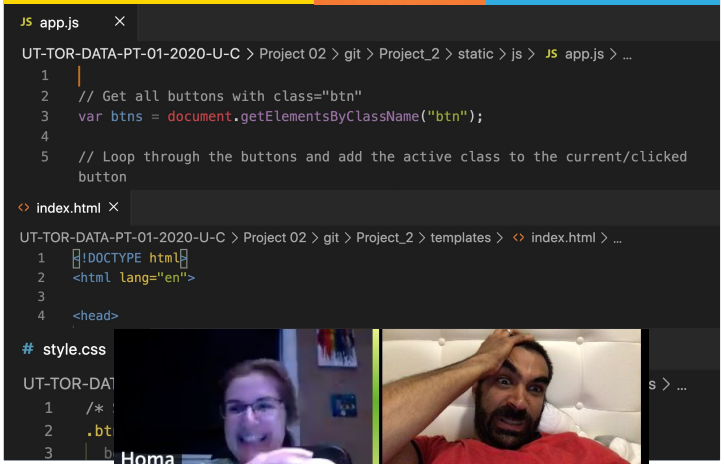
Why was it difficult?

Multiple API routes were created due to the large size of data and filtering requirements

Front-end

Java Script, HTML, CSS

Level of Difficulty



What was done?

- All JSON data called from Flask API using D3
- Plots, charts, maps and dropdowns created
- Leaflet, plotly, Geojson libraries utilized
- Finalized styling via CSS

Why?

Dan said so!

Why was it difficult?

Beyond words!

Extra JS Library

Front end

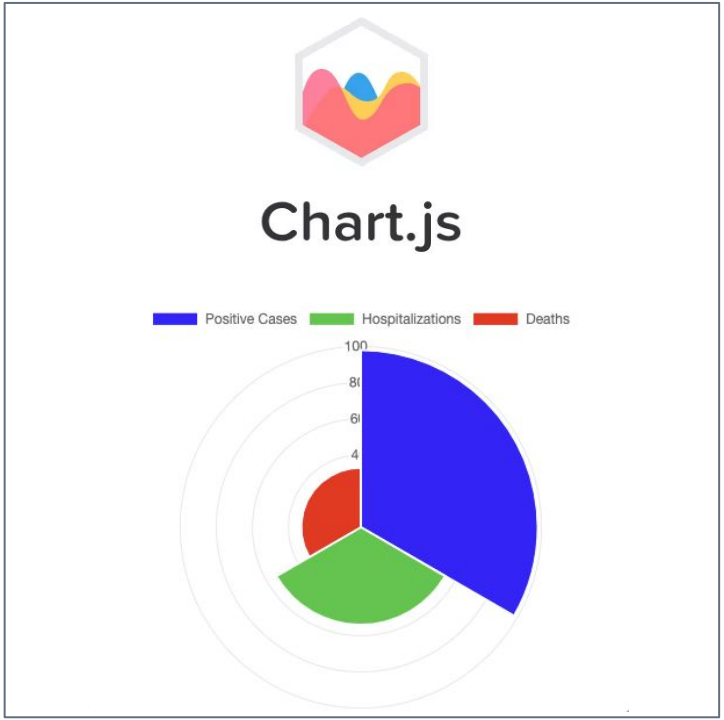
CHART.JS

https://chartjs.org

Level of Difficulty

What was done?

- Polar Area chart created to show proportions of COVID cases with a scale of value for context

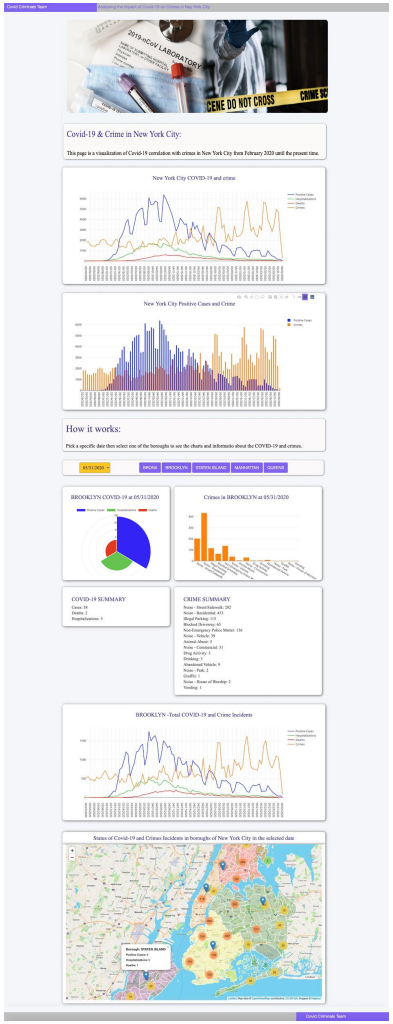


Why?

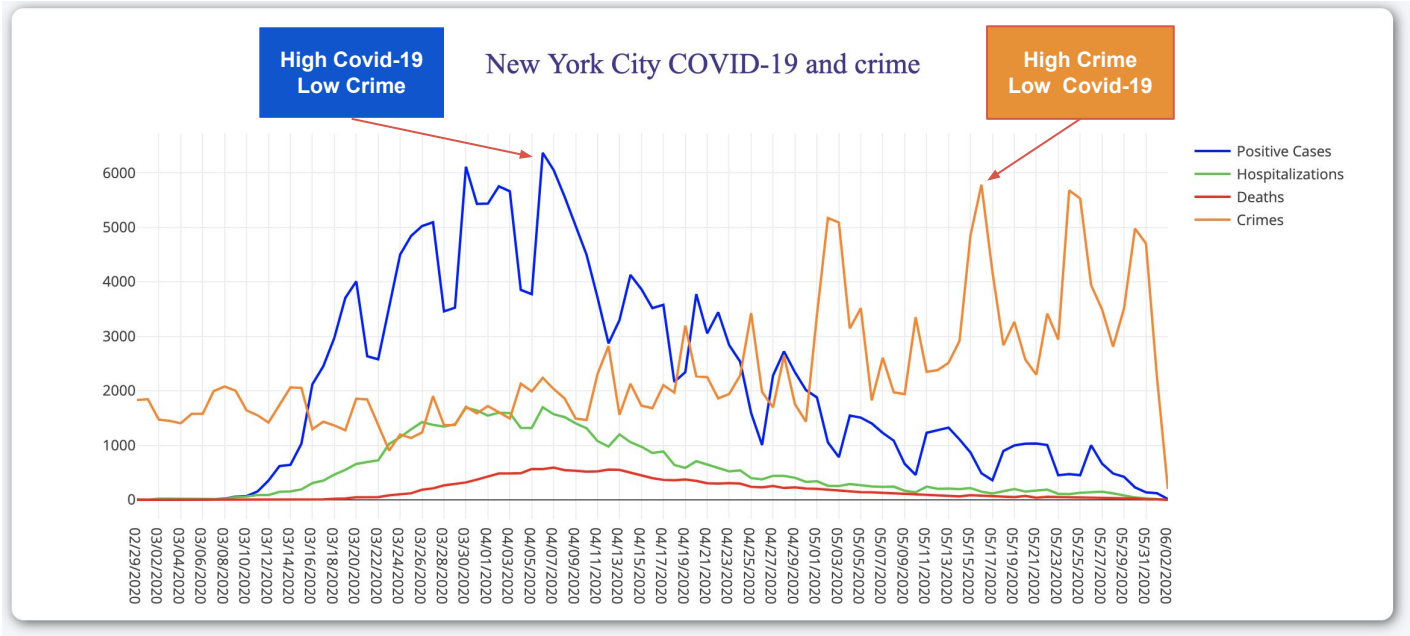
- Created to explore the functionalities of another JS library

Why was it difficult?

We had trouble deleting the initial data layer and updating the chart with new data

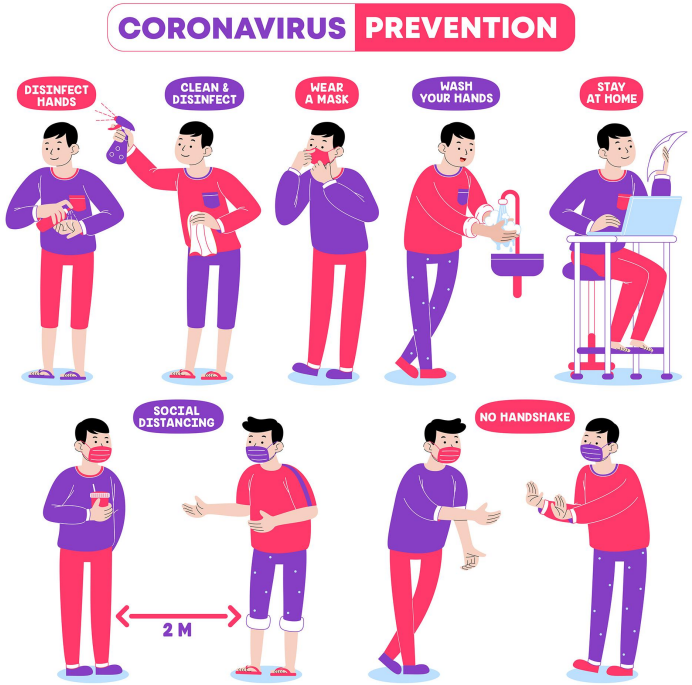


Final Application



Let’s see the project

Discussion Panel



Thank you!