Deliverable 3 Report - Team 4

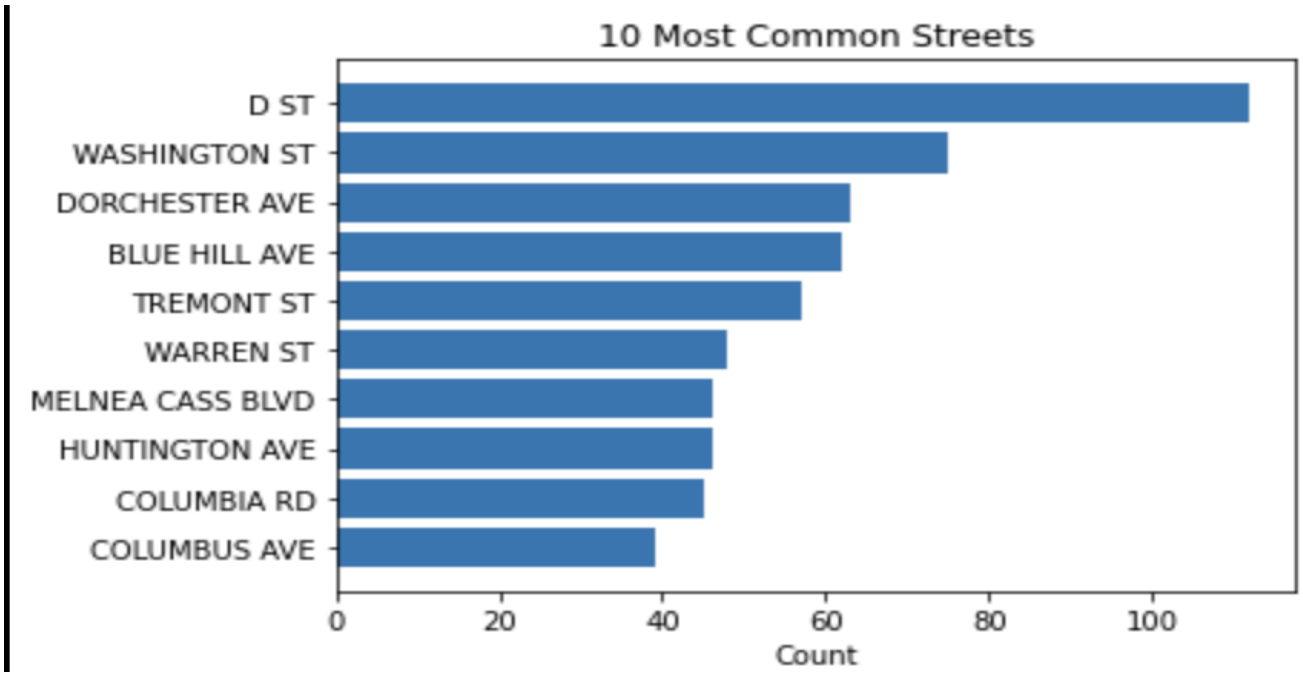
Extension Proposal:
Our project has analyzed victim data of District 4 shootings, including trends by race and gender, and identified decreasing trends in reported gun crimes. We have also analyzed field contacts data in Districts C11, B3, E13, B2 in D4, and conducted in-depth analyses of student discipline data.

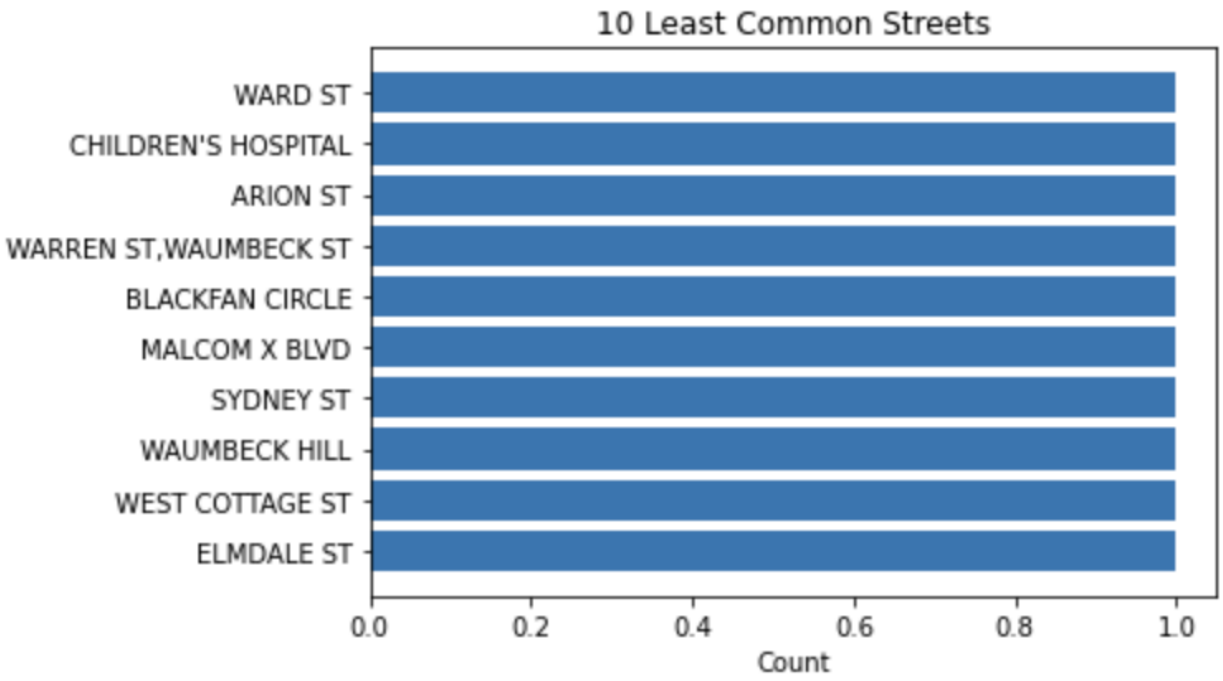
We propose to expand our project to incorporate Environmental/Community Factors, specifically focusing on Green Space, Tree Canopy, Interactions, and Pedestrian/Mobility data. This expansion will provide a more comprehensive understanding of the community's environmental health, social dynamics, and mobility options, enhancing our insights and recommendations for urban planning and community development.

Individual Contributions and Observations:

Patrick Wright: U96180673
Data used: Boston Traffic Dataset/https://data.boston.gov/dataset/traffic-related-data
Files:

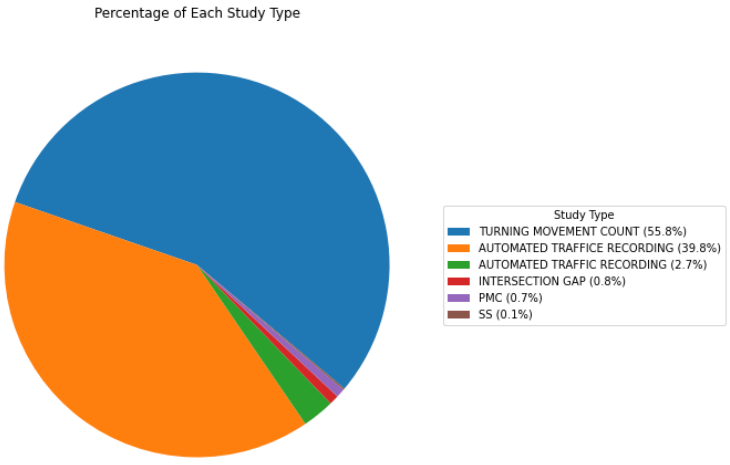
- ../data/BTDTrafficData
- ../deliverables/deliverables 3/code/TransportationGV.ipynb





Observations:

- We had slight trouble with the data
- We cut the data to focus solely on D4, however, after some research we found out that some of the streets were not found in D4.
- Keeping those ideas in mind, the graphs above show the top 10 most and least common streets that we found in the Traffic Dataset.



Observations:

The pie chart above shows the percentage of each study type in traffic data. The chart displays the most common study types and their corresponding percentage of the total count. The 'Turning Movement Count' study type is the most common type of study found within the dataset. These TMC counts are used for intersection analysis: traffic operation analysis, intersection design, transportation planning applications. From my understanding, these types in the traffic data refer to normal roads and intersections, which makes me wonder if shootings within district 4 are more likely to occur on streets where there are less bus stops and T stops due to there likely being less people. Again, I would need to gather more data in order to make a more accurate conclusion, but this is my thought process for the data at hand at the moment.

```
Study types for COLUMBUS AVE:
TURNING MOVEMENT COUNT    37
SS                         2
Name: Study Type, dtype: int64
Study types for COLUMBIA RD:
TURNING MOVEMENT COUNT    45
Name: Study Type, dtype: int64
Study types for HUNTINGTON AVE:
TURNING MOVEMENT COUNT    44
PMC                        2
Name: Study Type, dtype: int64
Study types for MELNEA CASS BLVD:
TURNING MOVEMENT COUNT    46
Name: Study Type, dtype: int64
Study types for WARREN ST:
TURNING MOVEMENT COUNT    48
Name: Study Type, dtype: int64
Study types for TREMONT ST:
TURNING MOVEMENT COUNT    57
Name: Study Type, dtype: int64
Study types for BLUE HILL AVE:
TURNING MOVEMENT COUNT    60
INTERSECTION GAP           2
Name: Study Type, dtype: int64
Study types for DORCHESTER AVE:
TURNING MOVEMENT COUNT    61
INTERSECTION GAP           2
Name: Study Type, dtype: int64
Study types for WASHINGTON ST:
TURNING MOVEMENT COUNT    75
Name: Study Type, dtype: int64
Study types for D ST:
TURNING MOVEMENT COUNT    106
INTERSECTION GAP            4
PMC                         2
Name: Study Type, dtype: int64
```

Here is some more data that I collected to further show that the 10 most common streets found within the data are of type ‘TMC’.

With this information, I also looked at some of the information that Vaishnavi found by using her map. I compared what I found vs. what she found in order to reach a hypothetical solution. From here, I can take this hypothetical solution and continue to look into information that could make the conclusion more accurate.

As I mentioned above, I believe that this data shows us that shootings seem more likely to occur in places with less things going on. (All aspects: people, transportation, etc.

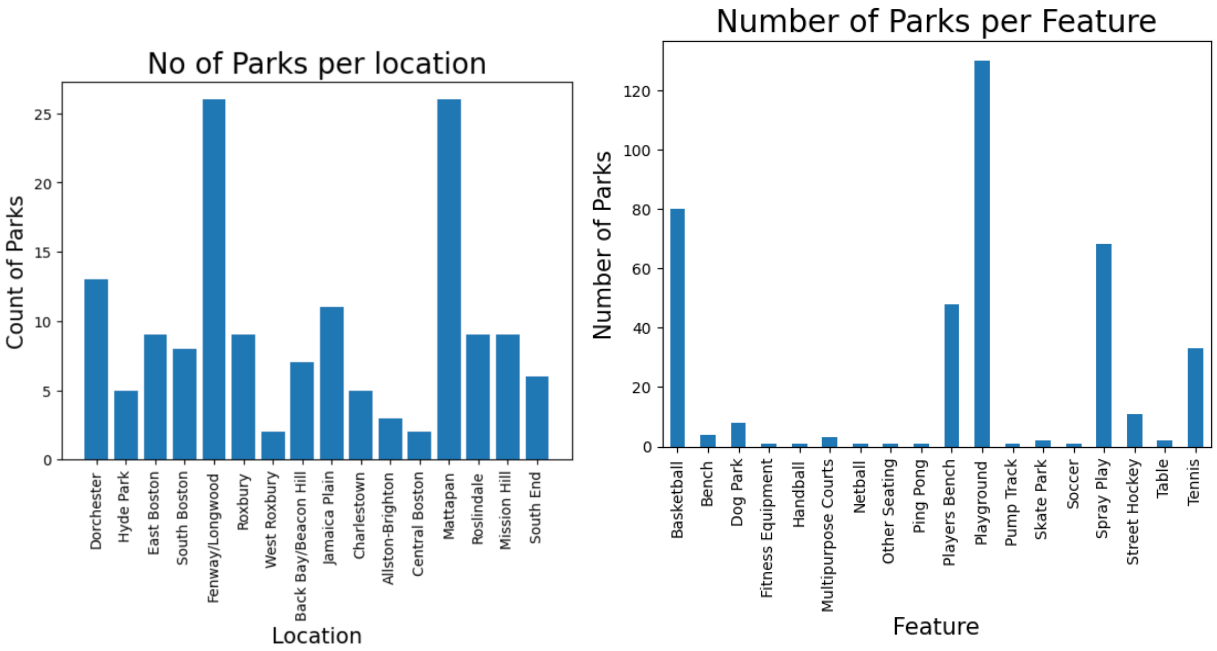
Snigdha Reddy Pulim:

Data used:

- Parks
- Crime Incident Reports - Datasets - Analyze Boston

Files:

- ../deliverables/deliverables 3/code/parks.ipynb
- ../deliverables/deliverables 3/code/count_on_borders.ipynb



Observations:

Top 5 neighbourhoods by count of Parks in the neighbourhood:
- Fenway/Longwood
- Mattapan
- Dorchester
- Jamaica Plain
- Roslindale; Mission Hill

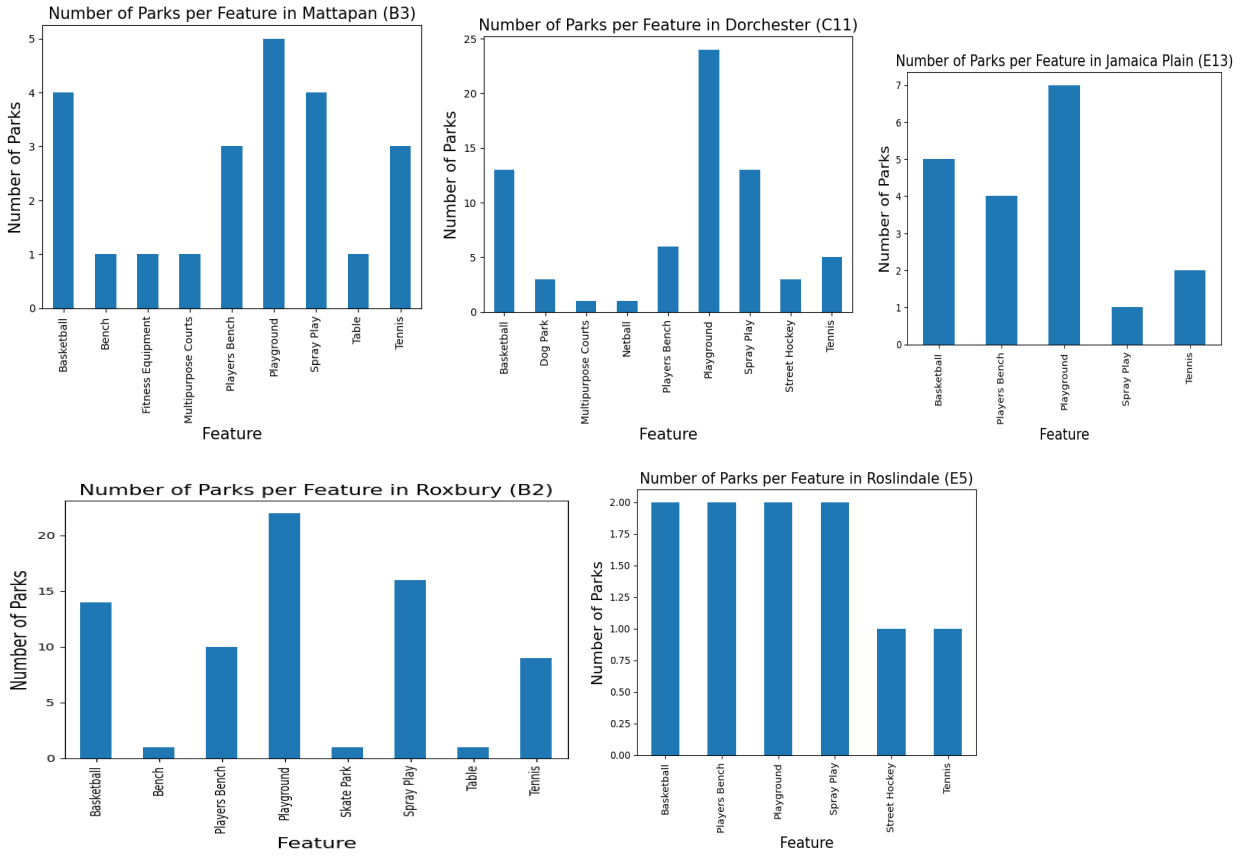
Top 4 neighbourhoods by count of Parks in the neighbourhood in District 4:
- Mattapan
- Dorchester
- Jamaica Plain
- Roslindale

Despite the high crime rate in District 4, it is interesting to note that the number of parks is also high, particularly in the top 4 neighborhoods listed above. This finding challenges the assumption that more parks necessarily lead to a reduction in crime.

From the plot, we can see that the top 5 features with the most parks are Playground, Basketball, Spray Play, Players Bench, and Tennis. This information can be useful for city planners and park management to understand the popular features among park visitors and make informed decisions on park upgrades and improvements.

Additionally, we can see that there are some features with very few parks, such as Boathouse and Ice Skating, which may indicate opportunities for further development in those areas.

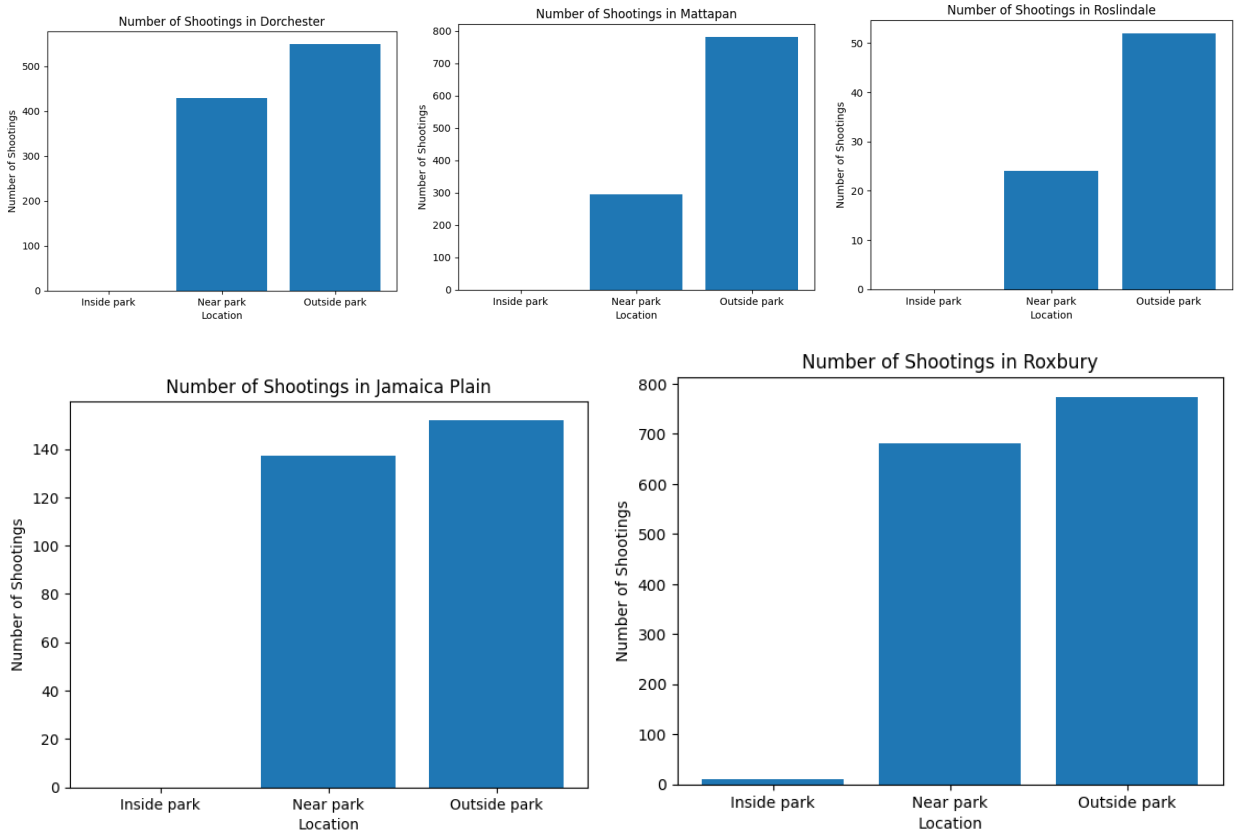
Overall, this analysis provides insights into the distribution of park features and can aid in decision-making for park management and planning.



Observations:

The plots reveal that different features are more prevalent in some locations than others. For example, in Dorchester and Roxbury, playgrounds are the most common feature in parks, while in Roslindale, basketball courts and baseball fields are more common. In Jamaica Plain, trails and paths are the most common feature in parks, and in Mattapan, spray pools and water play areas are more common.

Overall, the code provides useful insights into the distribution of park features in different areas of Boston, which can be helpful for city planners, community organizations, and residents who are interested in improving and maintaining their local parks.



Observations:

The given code analyzes crime data from 2015-2023 in several police districts in terms of shootings occurring inside, near, or outside parks. The code uses the Google Maps API to create polygons representing park boundaries and then determines whether a shooting occurred within a park or within 0.5 miles of a park.

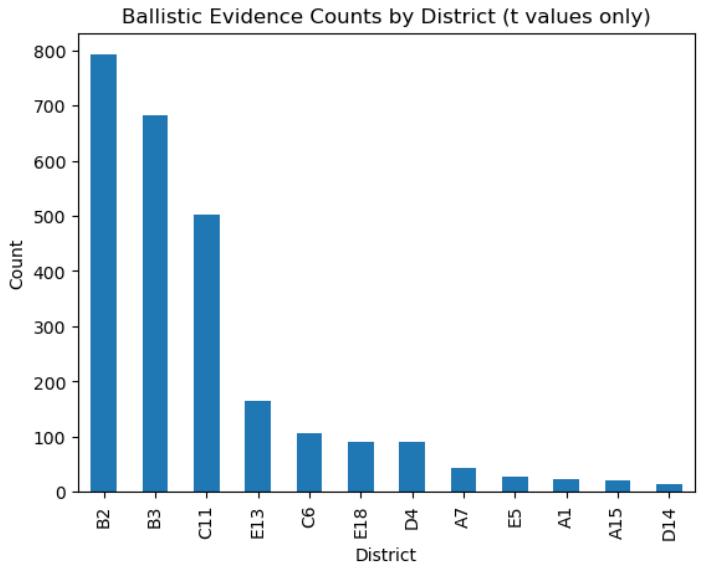
The analysis reveals that, for the most part, there are few incidents of shootings occurring inside parks. However, in Roxbury, there were approximately 20 such cases. More concerning is that a high percentage of shootings occurred within 0.5 miles of a park, although this rate varies across the districts.

It is worth noting that the differences in the number of parks and their density in each district could contribute to the variation in the number of incidents occurring within or near parks.

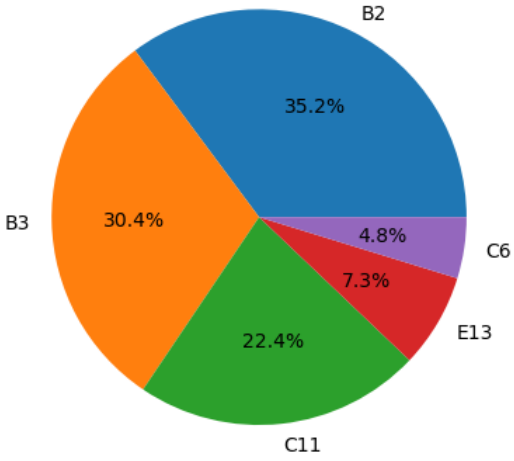
Tarek Mourad:

Data used: tmp_97z79tt.csv, tmpvyq0sbvq.csv

Files: ../deliverables/deliverables 3/code/gv2.ipynb

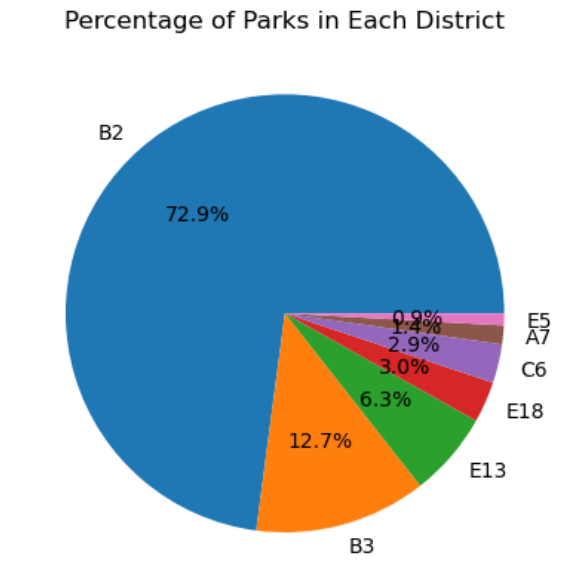


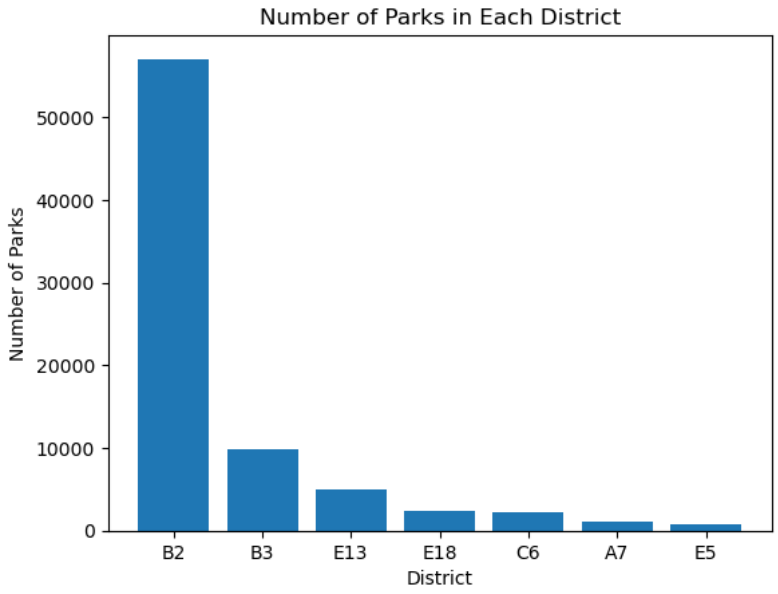
Distribution of Districts in which there is ballistic evidence



Observations:

Districts B2, B3, and C11 have the highest counts of ballistic evidence.





Observations:

Districts B2 B3 and E13 have the highest number of parks. Keep in mind district B2 contains Franklin Park, which is one of the biggest parks in Boston. District B2 has the highest count of parks and ballistic evidence and 4 out of the 5 districts with the highest counts of ballistic evidence are within the top 5 districts with the highest counts of parks.

Conclusion:

To conclude, there is a correlation between the number of parks and the number of shootings. The higher the number of parks within a district, the higher the number of shootings within that district.

Why so?

Hypothetical situations:

- **Drug deals in parks, fights, wide/open spaces could cause shootings.**

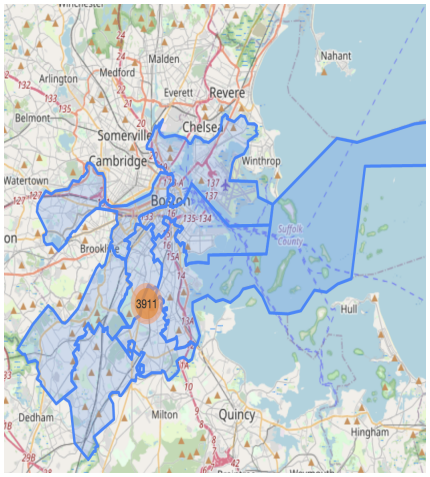
Vaishnavi Vadlamudi:

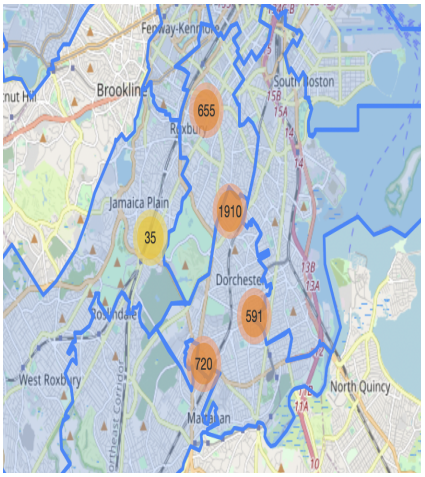
Data used: Crime Incident Reports - Datasets - Analyze Boston , Transit stops

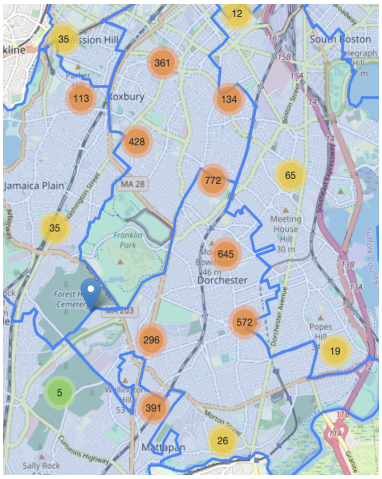
Files:

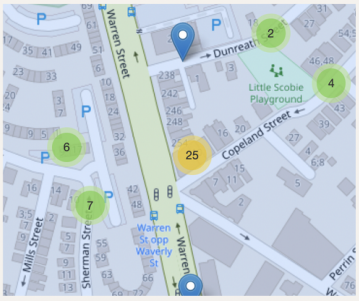
- ../deliverables/deliverables 3/code/CrimeIncidentReport_AllYears_Vaishnavi.ipynb
- ../deliverables/deliverables 3/code/ReadingShapeFiles.ipynb

Data visualization:

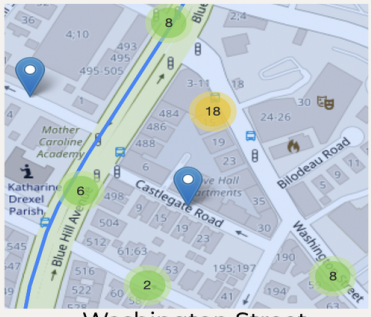




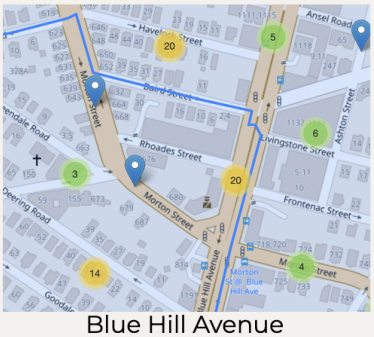




Warren street



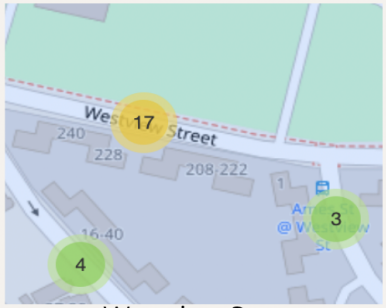
Washington Street



Blue Hill Avenue

Dudley Street

Draper Street



Westview Street

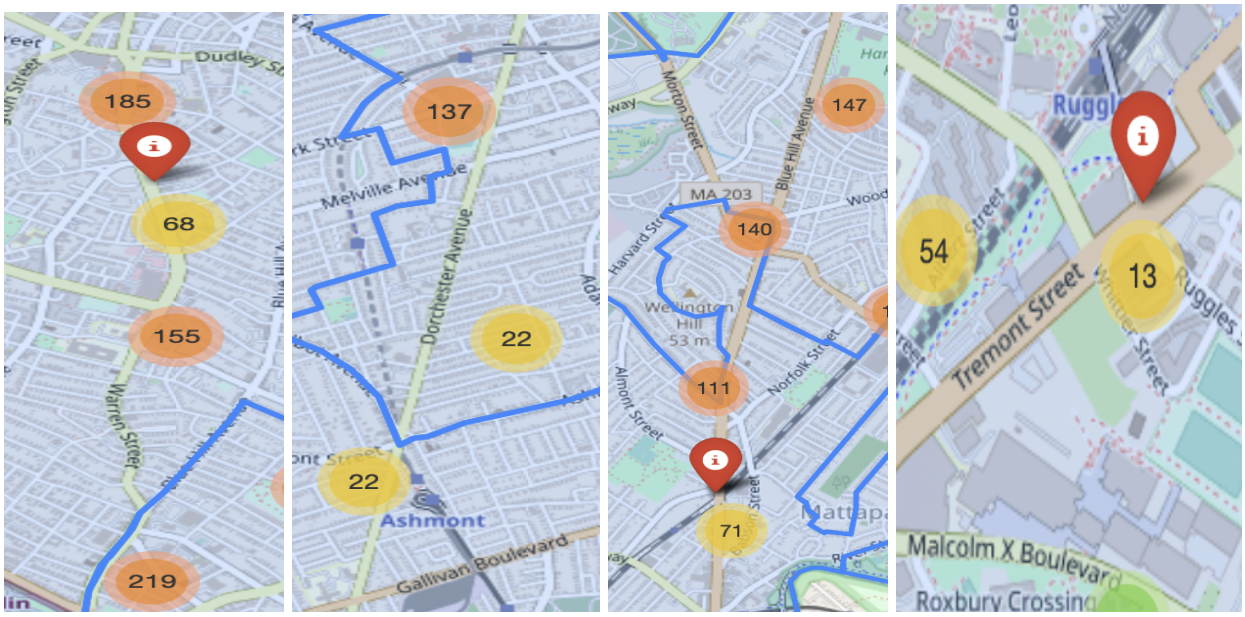
Observations part 1:

The above maps show the gun crime reports in a folium map, highlighting the streets with higher gun crime report incidents. Among these streets, Warren Street, Washington Street, Blue Hill Avenue, Dudley Street, Draper Street, and Westview Street stand out as areas with a high incidence of gun violence. Analysis of the crime reports reveals that the gun crime reports are noticeably higher than 15 in just one street over the past 7 years.

These findings are significant and have informed policies to increase police presence in these areas from 10 pm to 12 am, where the gun crime has been observed to be the highest. This information is presented in the Hourly Analysis section of the Deliverable 2 Report. The increased police presence is part of a broader effort to reduce the incidence of gun violence in the affected neighborhoods.

This was the basis for the next part of the data visualization.

Data Visualization Part 2:



Observations Part 2:
Furthermore, the analysis of the gun crime reports and the identification of the high-risk areas have led to additional visualizations of the data. For instance, we have created heat maps to provide a more comprehensive view of the prevalence of gun violence across the city. By visualizing the hotspots of gun violence, we can identify areas where intervention is most urgently needed.

In addition to the heat maps, we have also looked at the relationship between public transportation and gun violence.

Conclusion - Our analysis has shown that the streets with the highest number of public transportation stops are also the areas with the highest crime incidents. This finding is significant because it suggests that public transportation may be a contributing factor to gun violence in these areas.

Overall, the data visualizations have provided valuable insights into the prevalence of gun violence in Boston and have informed policies to reduce the incidence of crime in the affected neighborhoods. The next step in our analysis is to look at other factors that may be contributing to gun violence in these areas, such as socioeconomic factors and access to mental health services.

Furthermore, to check how the gun crime was throughout the 7 years on the day of our presentation which was also our teammate Tarek's birthday, I have done the following analysis:

On Tarek's birthday(Our Teammate), previous years:

376581	2019-04-14 01:23:00+00:00
376606	2019-04-14 03:05:00+00:00
376609	2019-04-14 04:16:00+00:00
376647	2019-04-14 10:03:00+00:00
460229	2020-04-14 20:18:00+00:00
529614	2021-04-14 08:27:00+00:00
529704	2021-04-14 16:21:00+00:00
529735	2021-04-14 18:34:00+00:00
529738	2021-04-14 18:45:00+00:00
602860	2022-04-14 12:37:00+00:00
602981	2022-04-14 22:20:00+00:00

376581	B3
376606	C11
376609	B3
376647	B3
460229	B3
529614	C11
529704	B3
529735	C11
529738	C11
602860	B2
602981	B3

This led to the following conclusion:

On this day every year, we have observed a total of 11 crime incident reports. The majority of these reports were filed in police districts B3 and C11. However, there has been a decreasing trend in the number of incidents reported in the past year. With this trend in mind, we hope that this year's crime incident reports will be minimal.