

Bad Landlords II: Councilor Breadon

Team 2

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Introduction

The Boston planning, zoning, and development process project seeks to increase transparency and accessibility while creating a trackable system to identify bad landlords and property violations. The goal is to develop usable data visualizations to establish a threshold for identifying bad landlords and analyze how various social factors contribute to the number and types of violations committed by landlords.

The project's big picture impact is to promote accountability among landlords and improve the quality of housing in Boston. By establishing a clearer threshold for identifying bad landlords and making the process more transparent, the project can empower residents to take action against landlords who violate their rights and provide substandard living conditions.

The analysis aims to comprehensively understand housing complaints, evictions, and related factors across neighborhoods by examining data from multiple sources. By identifying the top owners with the most complaints, merging demographic data with complaint information, calculating and visualizing complaint density, incorporating eviction data, and creating focused DataFrames for high eviction rate neighborhoods, the analysis aims to uncover the underlying factors influencing housing stability and landlord-tenant relationships.

Through this analysis, Councilor Breadon can identify socio-economic factors that contribute to bad landlords' prevalence in certain areas. The city government can invest in targeted programs such as affordable housing initiatives or job training programs to improve residents' quality of life and enhance the overall housing situation in Boston. This information can also inform policy decisions and develop targeted interventions to improve housing conditions in affected neighborhoods.

2. Base Analysis

2.1 Dataset

We have used the following datasets for our analysis:

Rentsmart dataset

311 complaints dataset

Boston Neighborhood Demographics

Boston Evictions Data

Building and Property Violations Dataset

2.2 Analysis

What are the most common types of housing violations and complaints in different neighborhoods?

The analysis of neighborhoods' complaints

We collected the neighborhoods' complaint status. These complaints can be divided into two types. The first situation is the complaints solved on time, while the other is the neighborhood complaints which are overdue. As seen in Figure 1, the proportion of complaints resolved on time and overdue varies. Brighton is the area with the least number of on-time resolved complaints, while Fenway, Kenmore, Audubon Circle, and Longwood have the most on-time resolved neighborhood complaints.

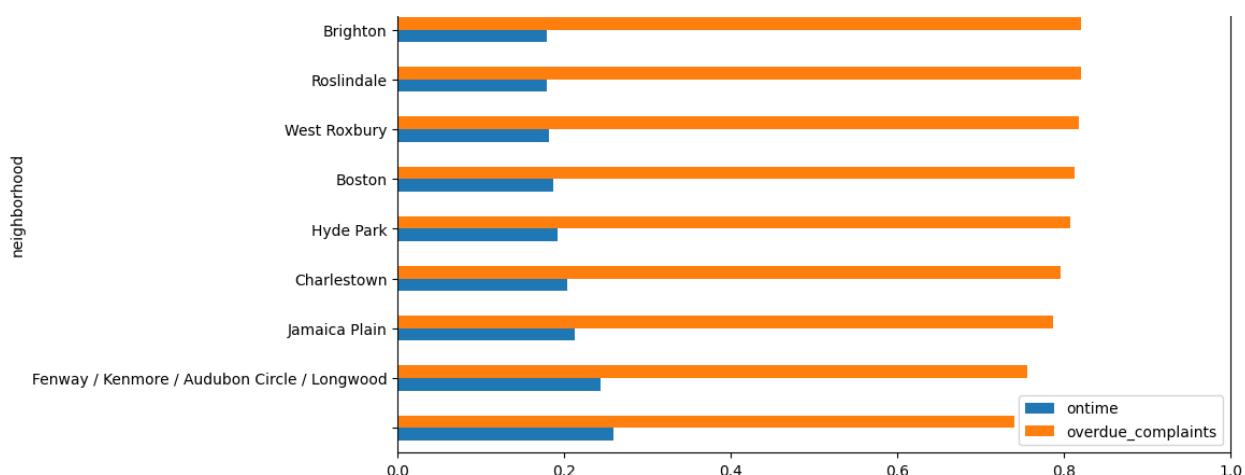


Figure 1: different neighborhoods' complaints status

To explore the neighborhoods' complaints status further, we added another analysis aspect: whether the neighborhoods' complaints are open cases or closed cases. For open cases, these complaints are pending resolution or being resolved. For closed cases, the complaints have been resolved. From Figure 2, we can see the proportion of open or closed complaints. West Roxbury has the highest proportion of open cases.

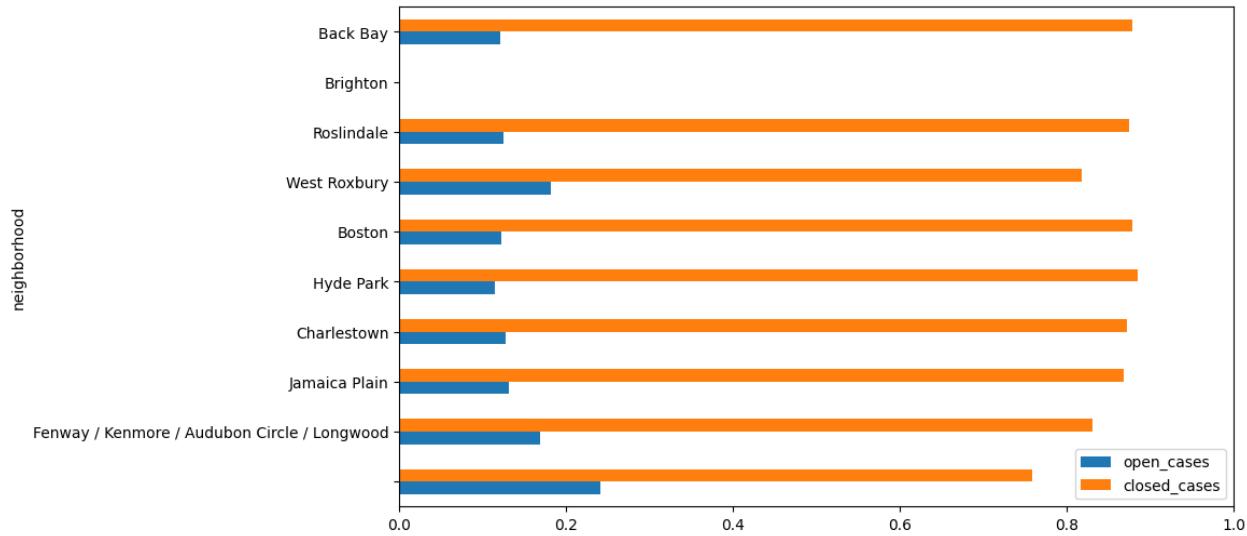


Figure 2: different neighborhoods' case status

The visualization of neighborhoods' complaints

We collected the latitude and longitude data of each neighborhood and added it to the df_prop datafram, then plotted the map.

As seen in the map below, the larger the marker, the more complaints there are in that area. The size of the markers is proportional to the number of open complaints. The red marker indicates complaints still in progress, while the green marker means the complaints are overdue. The red markers and the green markers normally come up in pairs, indicating that this area has many tenants' complaints, whether in the past or just recently.

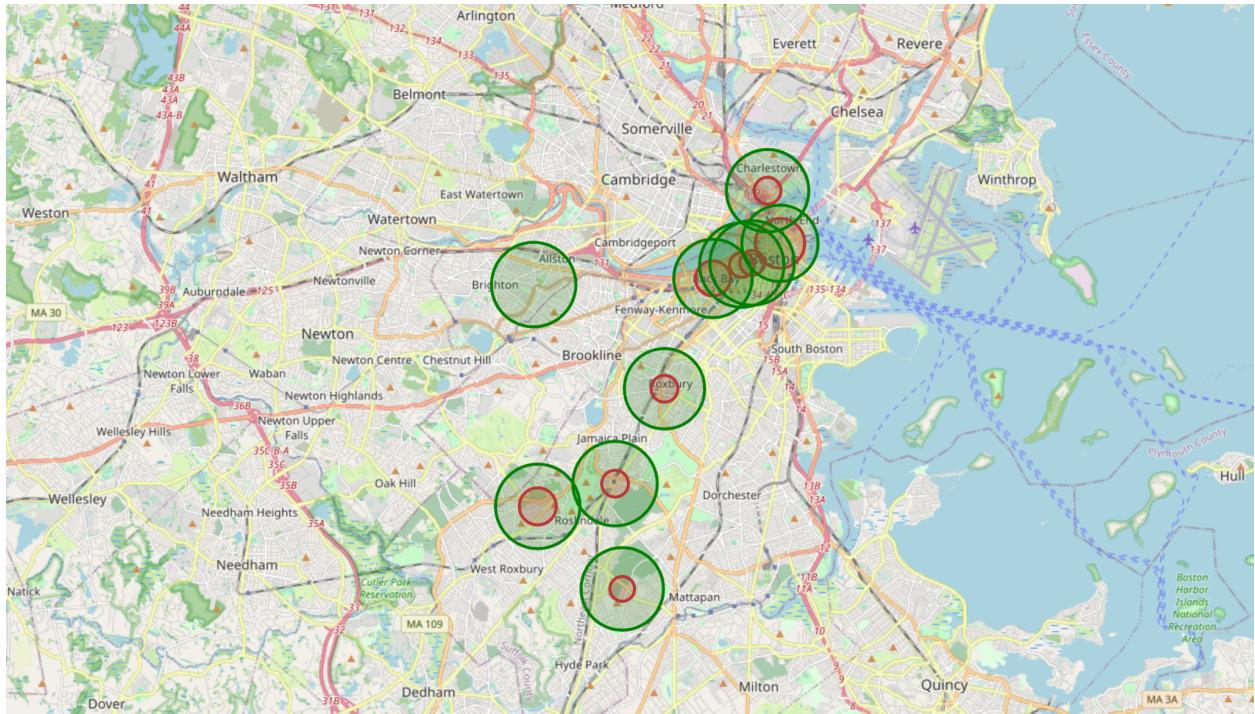


Figure 3.1: the red markers represent the volume of complaints in the area

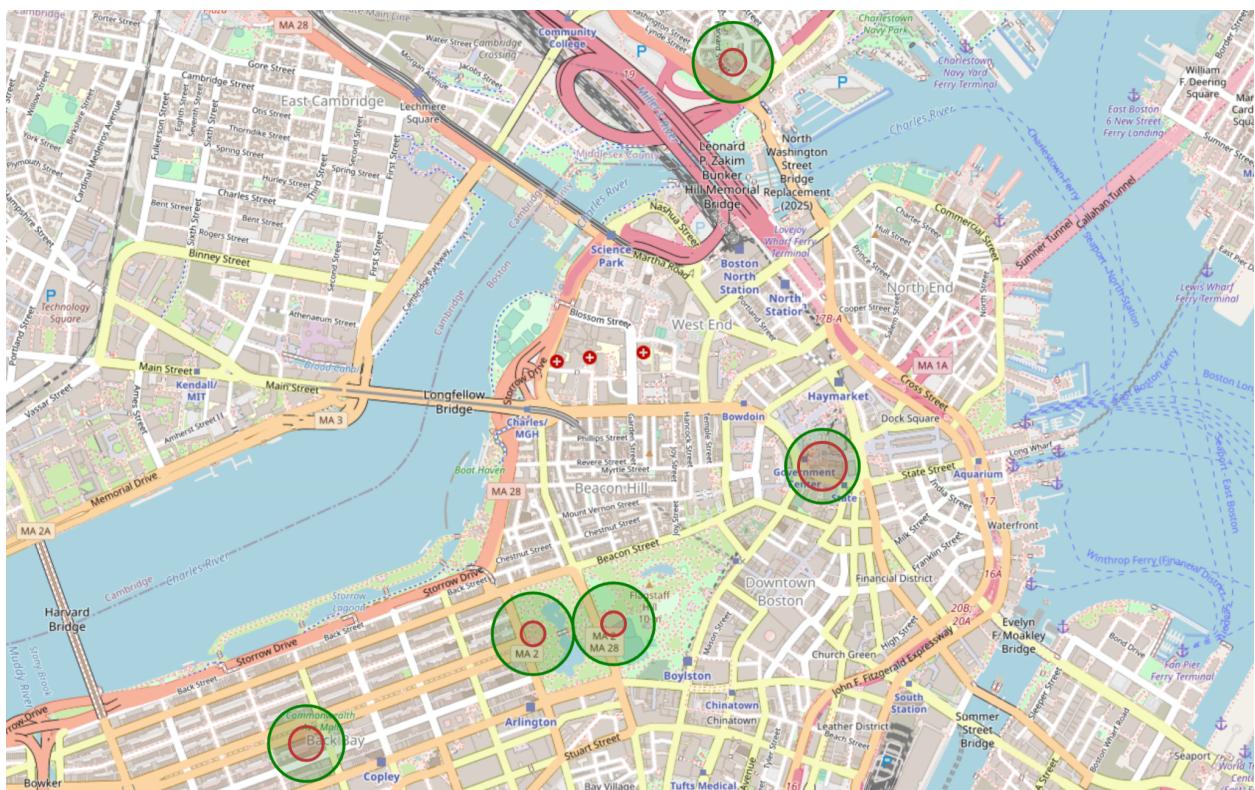


Figure 3.2: more detailed map

The analysis of violations

We analyzed the behavior of violations, and the top 10 most common violations are in Table 1. The top three violation behaviors are Failure to Obtain Permit, Unsafe and Dangerous, and Owners' Responsibility to Maintain Structural Elements - Structural elements shall be maintained free from holes, cracks, loose plaster, or other defects.

Top 10	Violations
1st	Failure to Obtain Permit
2nd	Unsafe and Dangerous
3rd	Owners Responsibility to Maintain Structural Elements - Structural elements shall be maintained free from holes, cracks, loose plaster, or other defects
4th	Owners Installation/Maintenance Responsibility - All facilities and equipment which are required by the owner including but not limited to water, gas, electrical and heating, shall be installed in accordance with all accepted codes
5th	Maintenance
6th	Extermination of Insects, Rodents and Skunks - The owner of a dwelling containing two or more dwelling units shall maintain it and its premises free from all rodents, cockroaches and insect infestation and shall be responsible for exterminating them
7th	Extermination of Insects, Rodents and Skunks - Extermination shall be accomplished by eliminating the harborage places of insects and rodents. All use of pesticides shall be in accordance with applicable laws and regulations of the Department of Food and Agricultures Pesticide Board
8th	Smoke Detectors & Carbon Monoxide Alarms - Owner shall provide, install and maintain in operable condition smoke detectors and carbon monoxide alarms
9th	Extermination of Insects, Rodents and Skunks - The owner of a rooming house shall maintain it and its premises free from all rodent, cockroaches, and insect infestation and shall be responsible for exterminating them
10th	Testing & Certification

Table 1: the top 10 most common violations

Figure 4 shows the proportion of top 10 most common descriptions of violations.

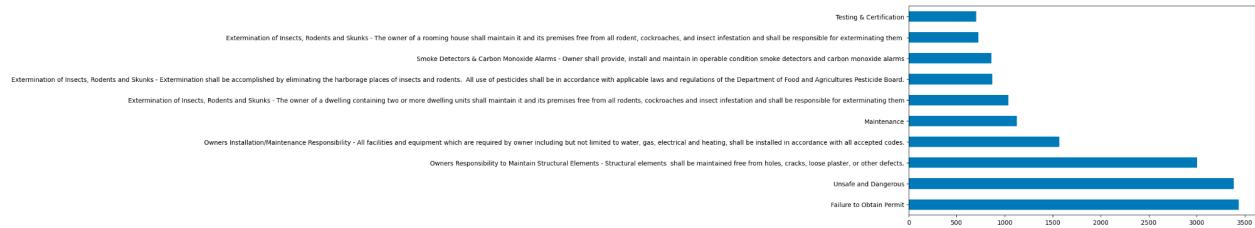


Figure 4: the top 10 most common violations

The visualization of violations

We collected the latitude and longitude data of each neighborhood's violations and added it to the df_prop dataframe, then plotted the map.

From Figure 5, we can observe the condition of violations and how they are distributed in the area of Boston. In the areas of Dorchester, Roxbury, South End, and Beacon Hill, there seem to be more violations, and the heatmap gets denser.

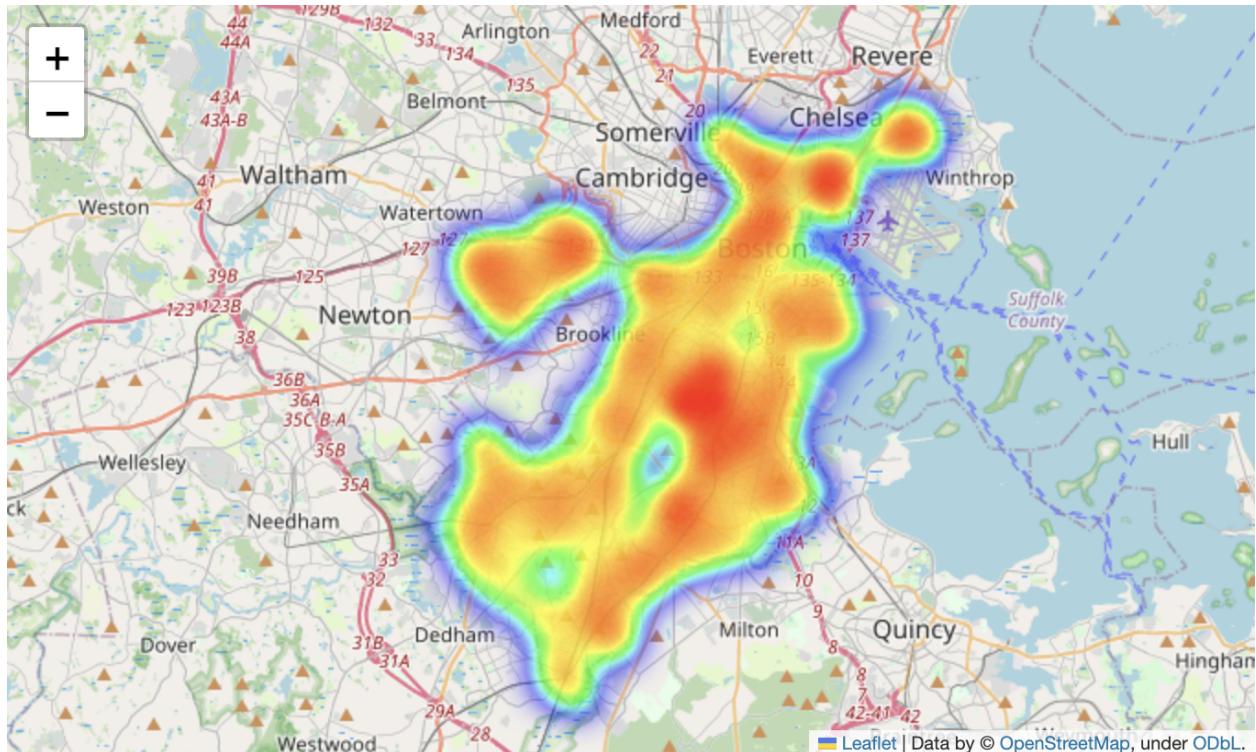


Figure 5: heatmap of violations

Getting an accurate picture of violations

To get an accurate picture of violations and evictions in each neighborhood, we normalized our dataset by dividing the total number of complaints in each neighborhood by the number of housing units for rent in that neighborhood to get the 'complaints_per_pop' feature. The feature is used for all further analysis and visualizations.

From Figure 6, an analysis of most common types of violations show that Enforcement violations form a majority of the chunk, followed by housing complaints and sanitation requests. From Figure 7, drilling down on Most frequent types of Enforcement Violations, it can be seen that Improper disposal of trash is the most common violation followed by overfilling a dumpster and overgrown vegetation on property.

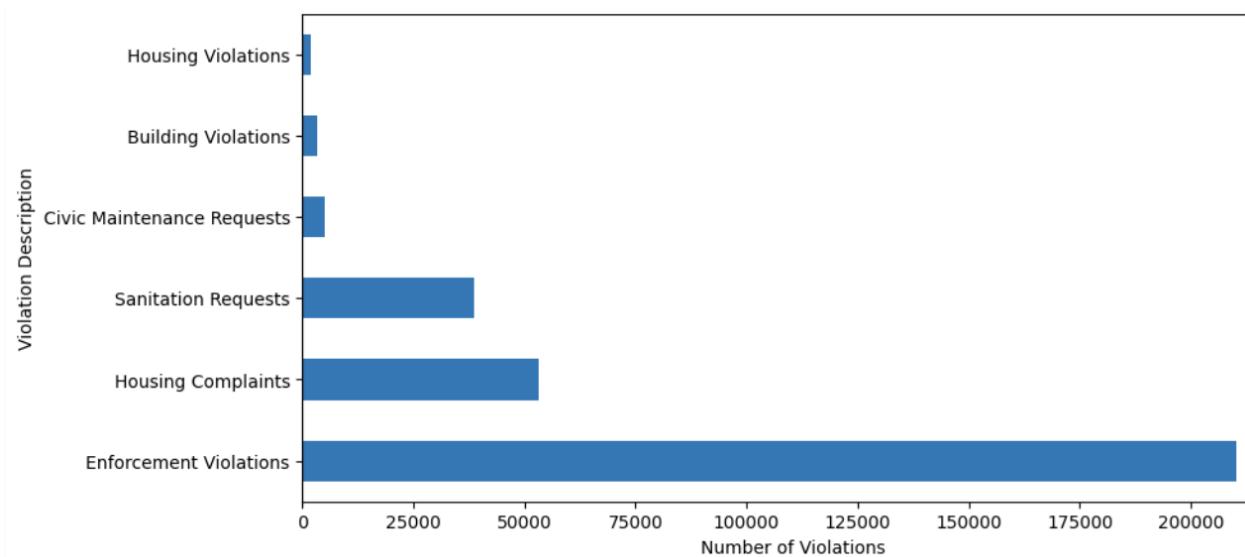


Figure 6: most common types of violations

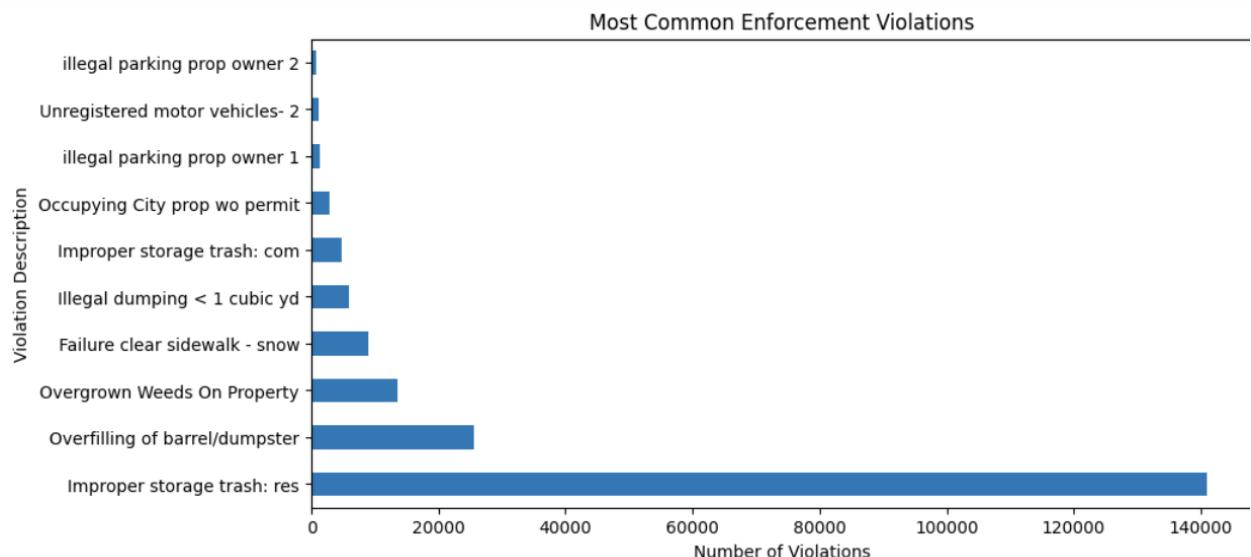


Figure 7: most common enforcement violations

As it shows in Figure 8, doing an analysis of most common types of violations per neighborhood, it can be seen that Enforcement Violations again are a major chunk, followed by Housing and Sanitation requests.

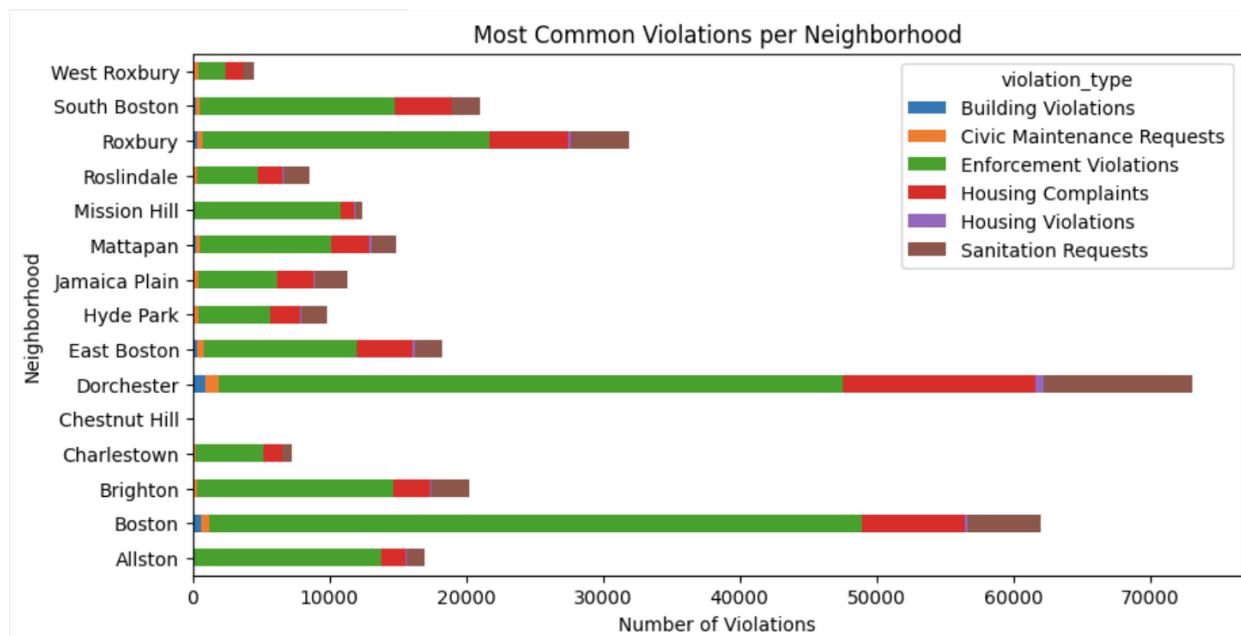


Figure 8: most common violations per neighborhood

Which landlords or property management companies have the highest number of recorded violations?

The analysis of complaints and eviction rate

We collected data from the income-restricted inventory and Eviction Filings Boston Neighborhood, summed all the units in each neighborhood, found out the number of complaints in each neighborhood, and named the column as 'complaints.' We used regex to find the number of evictions in each neighborhood (merged columns with greater than 30% match in the name) and added the number of open complaints to the dataframe.

	neighborhood	complaints	eviction_rate	open_complaints
0	Dorchester	39209	2.1	0.090515
1	Roxbury	23541	6.7	0.092265
2	South Boston / South Boston Waterfront	23264	1.2	0.083176
3	East Boston	19151	2.9	0.065688
4	Allston / Brighton	19090	2.9	0.084180
5	South End	18860	1.2	0.094327
6	Downtown / Financial District	16496	NaN	0.110572
7	Jamaica Plain	16051	1.9	0.132079
8	Back Bay	13850	0.9	0.121733
9	Greater Mattapan	10873	1.3	0.114688
10	Hyde Park	10554	3.8	0.115406
11	Roslindale	9910	2.9	0.125227
12	Boston	9720	2.9	0.121914
13	Charlestown	9419	1.0	0.127933
14	West Roxbury	8963	1.3	0.182082
15	Beacon Hill	8854	0.9	0.104247
16	Fenway / Kenmore / Audubon Circle / Longwood	5463	NaN	0.169504
17	Mission Hill	5426	2.9	0.105971
18	South Boston	2481	2.9	0.097138
19		2433	NaN	0.240855
20	Brighton	1484	1.0	0.084232
21	Allston	782	2.9	0.113811
22	Mattapan	543	1.3	0.084715
23	Chestnut Hill	33	2.1	0.030303

Table 2: the neighborhoods' eviction rate and complaints number

We can clearly see each neighborhood's complaints and eviction rate. We ranked this data via the neighborhood's number of complaints, and the eviction rate is not proportional to the number of complaints. It depends on the actual situation of each area, which varies from what we have imagined.

The visualization of complaints and eviction rate

We collect the neighborhoods' open complaints and the eviction rate, then draw a visual comparison chart. From Figure 6, we can see that Roxbury has the highest eviction rate up to 6.7 with an open complaints rate of about 0.09. Hyde Park has the second highest eviction rate at about 4 with an open complaints rate around 0.115.

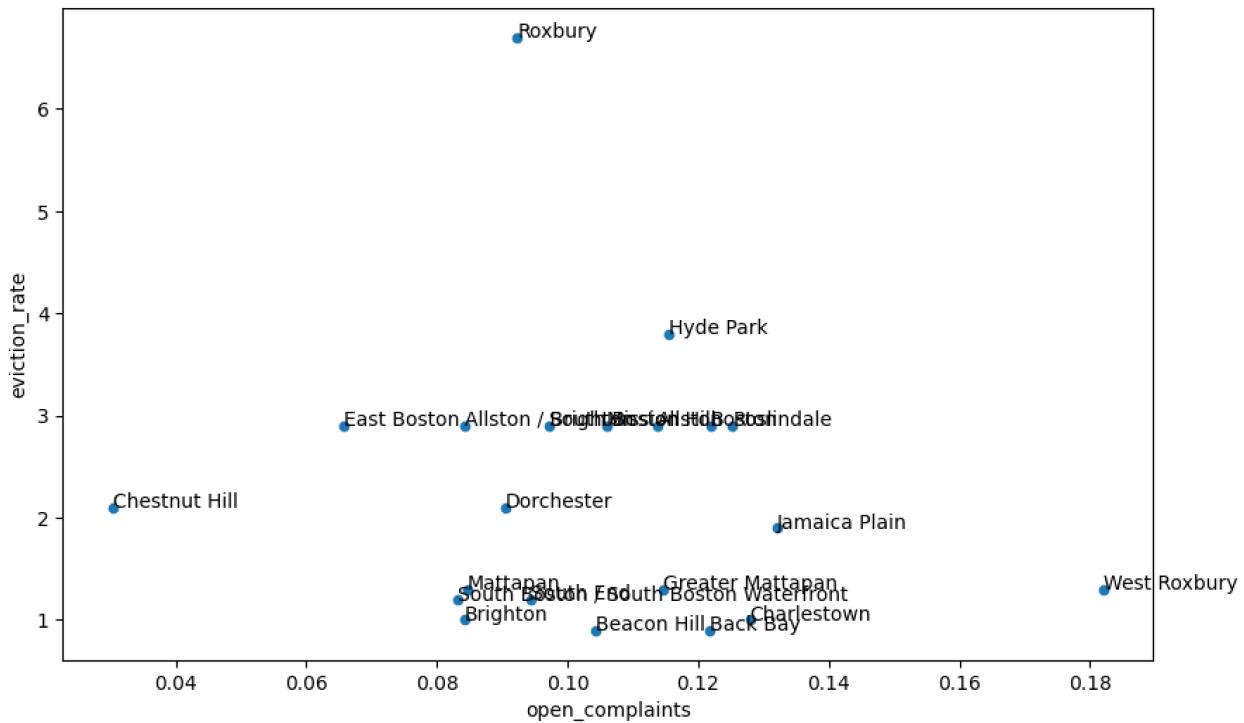


Figure 9: the open complaints vs eviction rate

The analysis of landlords or property management companies with the highest number of recorded violations

Looking at Figure 10, we can observe the landlords or property management companies with the highest number of recorded violations. GBM PORTFOLIO OWNER LLC stands out as the top violator. In addition, Figure 11 provides

information on the most common types of violations for each landlord. It is noteworthy that enforcement violations account for the largest proportion of violations, with GBM PORTFOLIO OWNER LLC having the highest number of such violations, exceeding 1,700 occurrences.

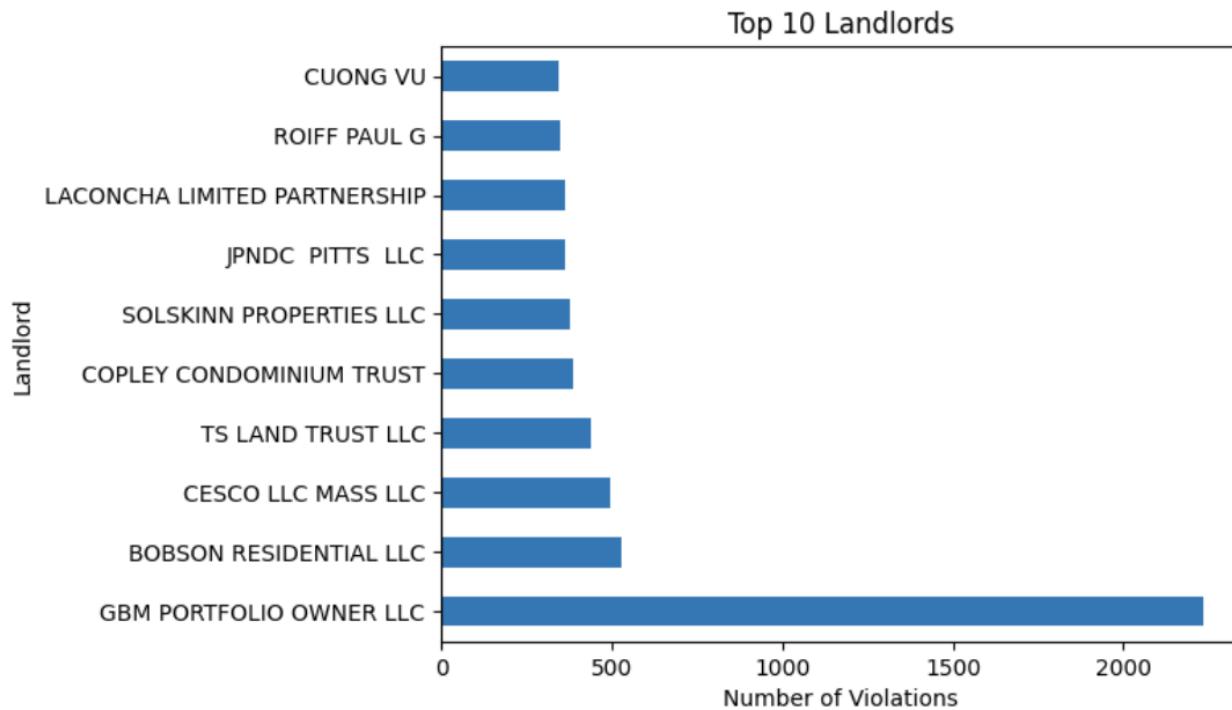


Figure 10: top 10 landlords with the the most number of recorded violations

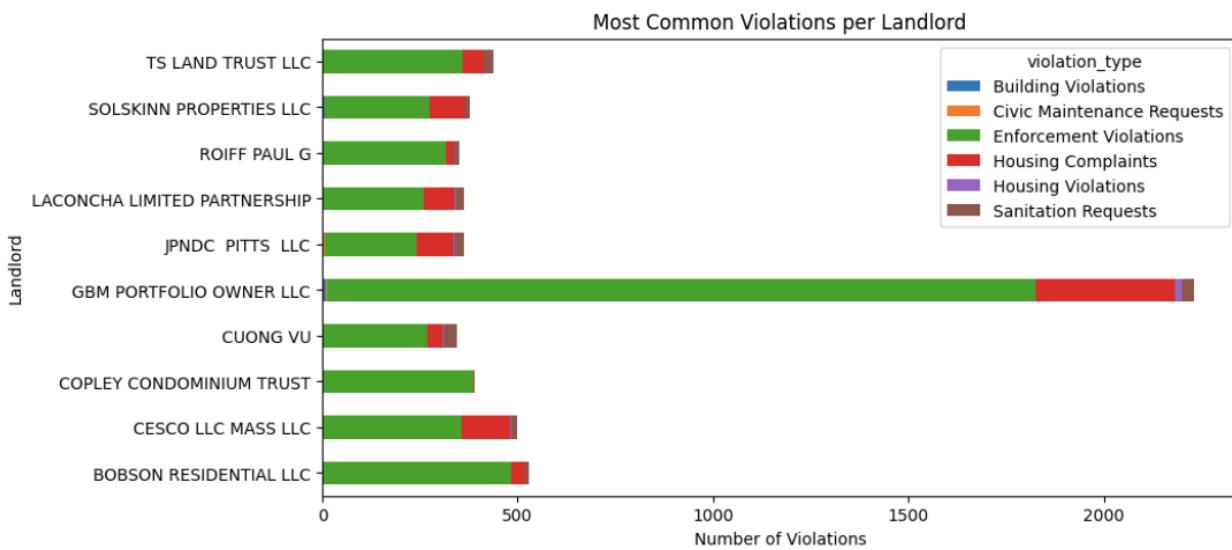


Figure 11: the proportion of the top 6 violations among the top 10 landlords with the highest number of recorded violations.

The analysis of neighborhoods with most violations per unit

Figure 12 displays the analysis of blocks with the most violations by the unit, which is a useful method for identifying areas with a high concentration of housing violations within neighborhoods. The analysis is presented in a map format, where each of the top 12 blocks is represented by a circle whose size corresponds to the number of violations recorded in that particular block.

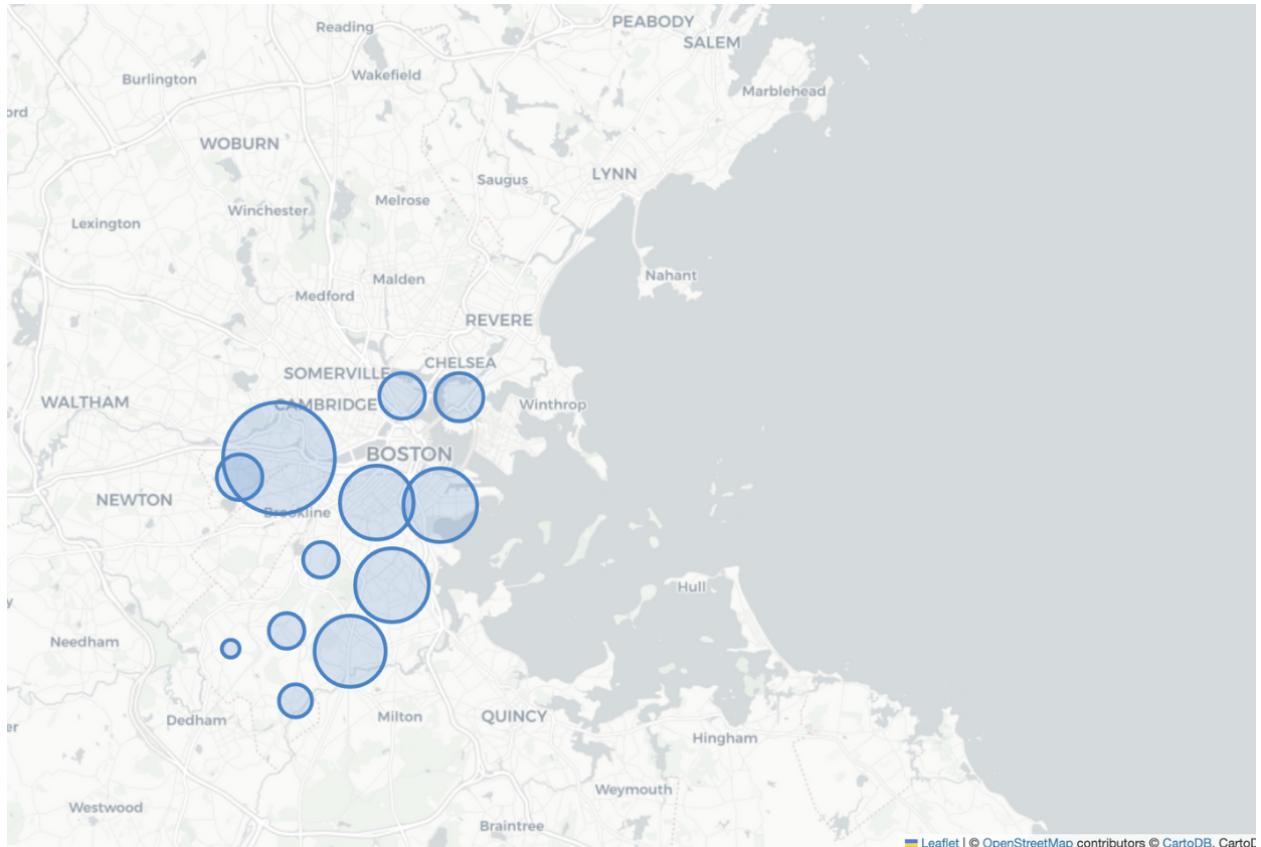


Figure 12: neighborhoods with the most violations per unit

Figure 13 provides a specific analysis of the communities circled on the map in Figure 12. It shows the proportion of complaints per population of the top 12 neighborhoods with the largest number of violations. This analysis is useful for understanding the types of violations that are most prevalent in these neighborhoods in relation to the population size. As we can see, Allston has the highest complaints per population, with a value of over 80%.

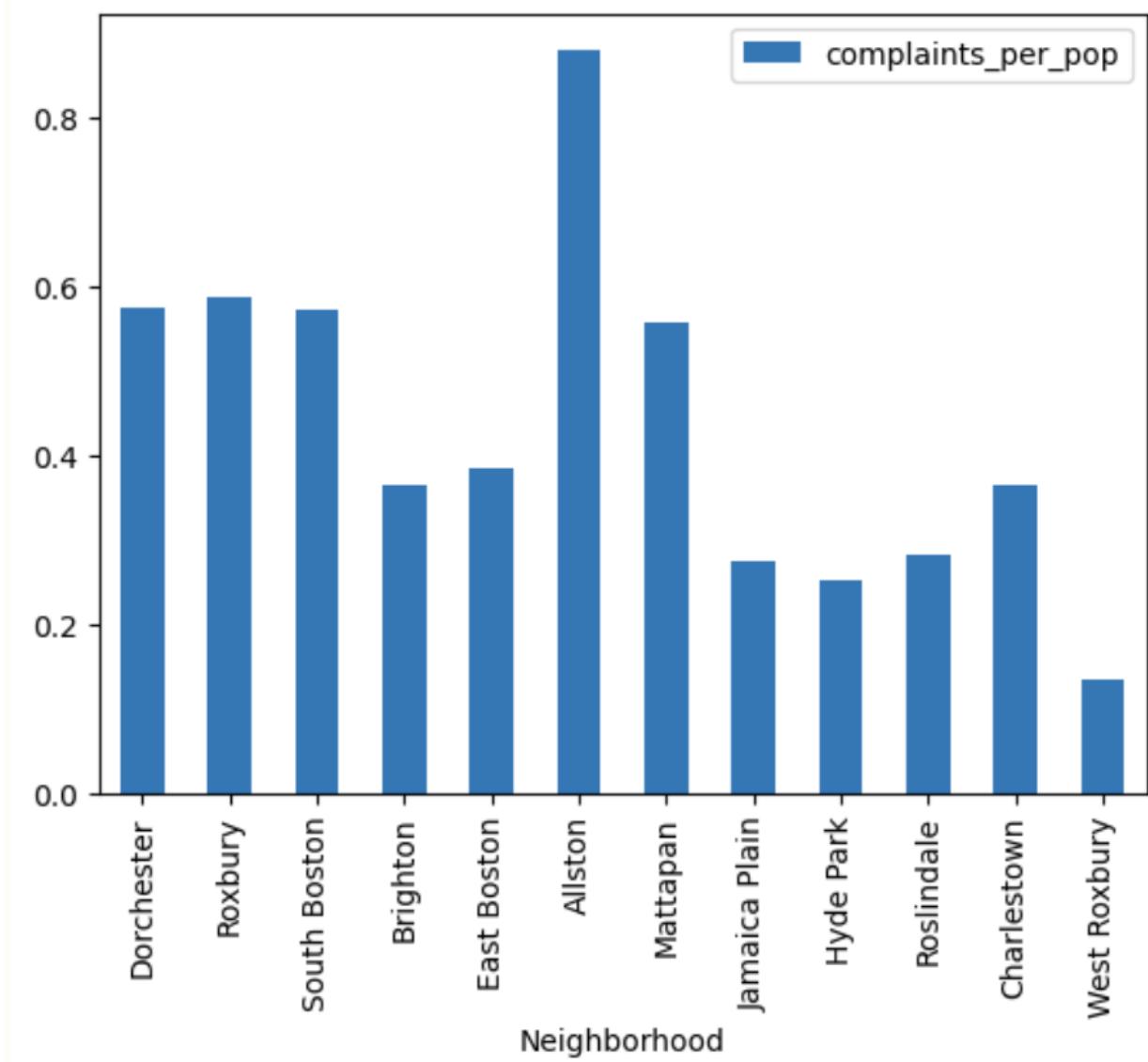


Figure 13: the proportion complaints per population of the top 12 neighborhoods with the largest number of violations

Is there a correlation between flouting housing maintenance code and utilizing evictions to harass tenants?

In our analysis, we studied the relationship between complaints_per_pop and Annual Eviction Filing Rate of each neighborhood in Boston for which we had the eviction data. We found a very slight negative correlation of -.0037 between the two, indicating that we cannot conclude anything about utilizing evictions to harass

tenants. However we did find out a strong positive correlation (0.8) between the complaints_per_pop and % of Housing Units that are rented but not occupied. Which suggests that as the number of complaints in the neighborhood increase, so does the percentage of housing units that are rented out but are not occupied.

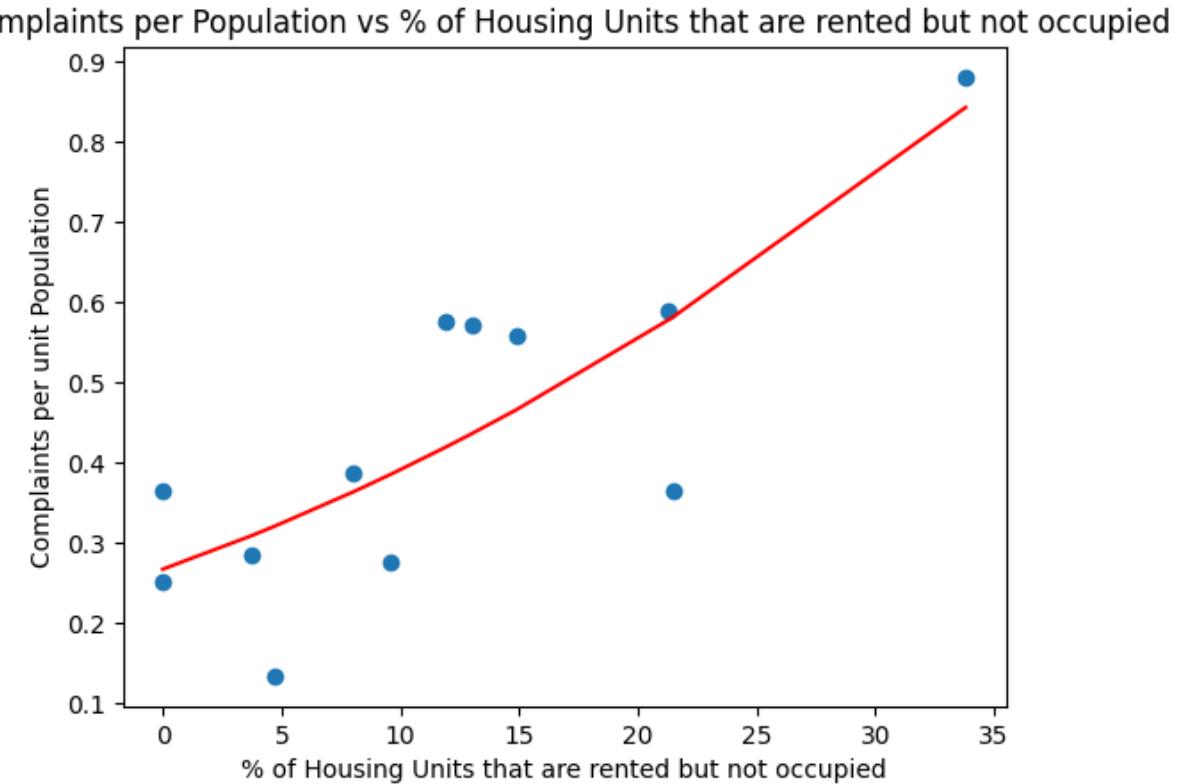


Figure 14: complaints per population VS % of housing units that are rented but not occupied

Figure 14 displays a plot of complaints per population VS % of housing units that are rented but not occupied. Fitting a line through the data, we get a trendline with a strong positive slope, indicating a strong positive relationship between the two features.

What factors might explain the increase in complaints in a neighborhood along with an increase in the percentage of rented but not occupied properties?

From Figure 14, we can clearly see an increase in complaints in a neighborhood alongside an increase in the percentage of rented but not occupied properties.

This phenomenon could indicate several issues:

1. Could the rise in complaints be a result of factors like noise, crime, litter, or other issues that negatively affect the neighborhood's quality of life, leading to tenants leaving the area and increasing the number of unoccupied rental properties?
2. Is inefficient property management contributing to a higher percentage of unoccupied rental properties, as tenants may be unwilling to rent from landlords who do not address their concerns?
3. Can increased complaints be a sign that property managers are not adequately addressing the issues raised by residents, causing dissatisfaction and a higher turnover rate?
4. Does the increase in unoccupied rental properties indicate a growing presence of short-term rentals or vacation properties (e.g., Airbnb) in the area?
5. Are short-term renters causing the percentage of unoccupied rentals to be higher by occupying properties intermittently, and could this be leading to an increase in complaints from residents due to a lack of investment in maintaining the neighborhood's quality of life?

3. Extension Analysis

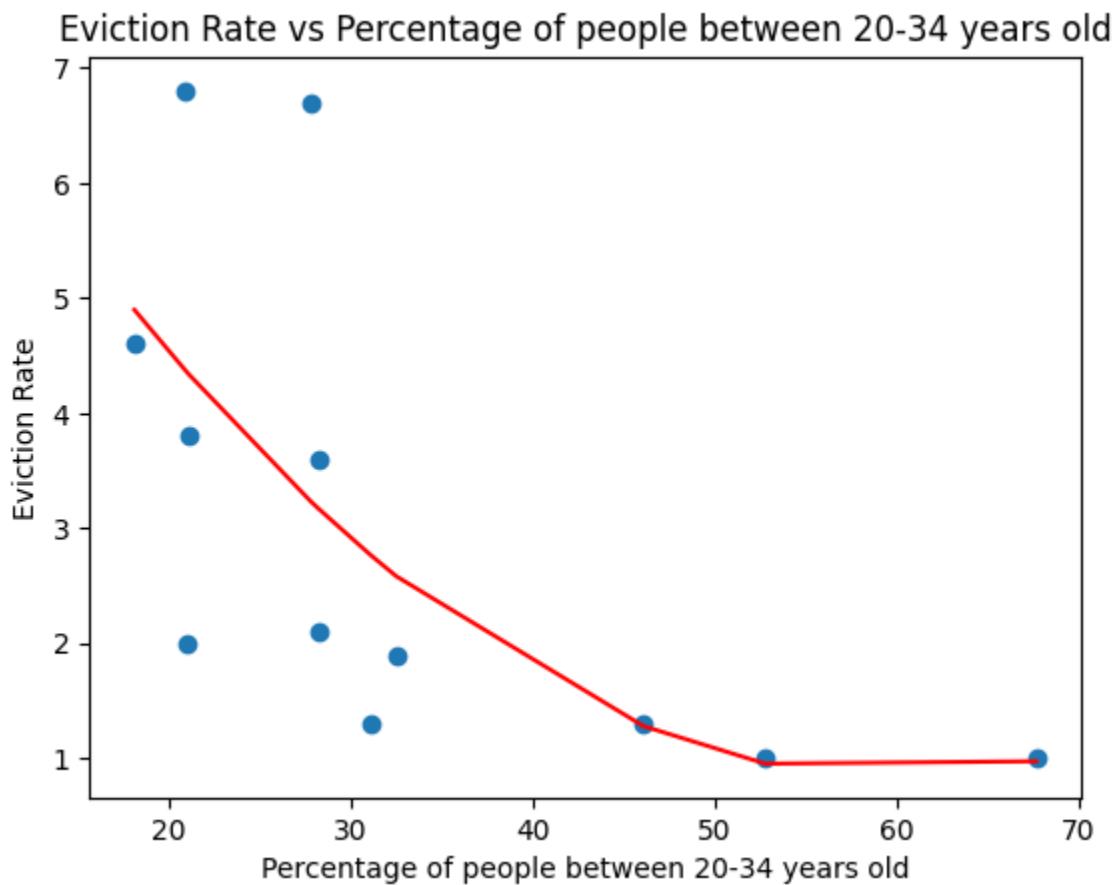
How do certain socio-economic factors, such as age, income, education, and profession, affect eviction rates in neighborhoods?

As a part of our extension project we are trying to identify if certain socio-economic factors affect eviction rates in neighborhoods. To do this, we have looked into factors like age, income, education, and profession. We found out that most of these factors do have an effect on violation and eviction rates and can be explored further to develop targeted interventions, inform policy decisions, and ultimately improve housing conditions in affected neighborhoods.

Age

We found out that eviction rates in a neighborhood come down as the proportion of population between ages 20-34 increases. There could be several factors contributing to this:

1. Does the decrease in evictions among this age group indicate improved economic stability, with more individuals finding stable employment and being able to afford their housing costs?
2. Are younger individuals more likely to live with roommates or family members, thus reducing their individual housing costs and lowering the risk of eviction?
3. Is there a shift in housing preferences among this demographic, with an increasing number choosing to rent or buy more affordable housing options, such as smaller apartments or homes in lower-cost areas, resulting in a lower eviction rate?

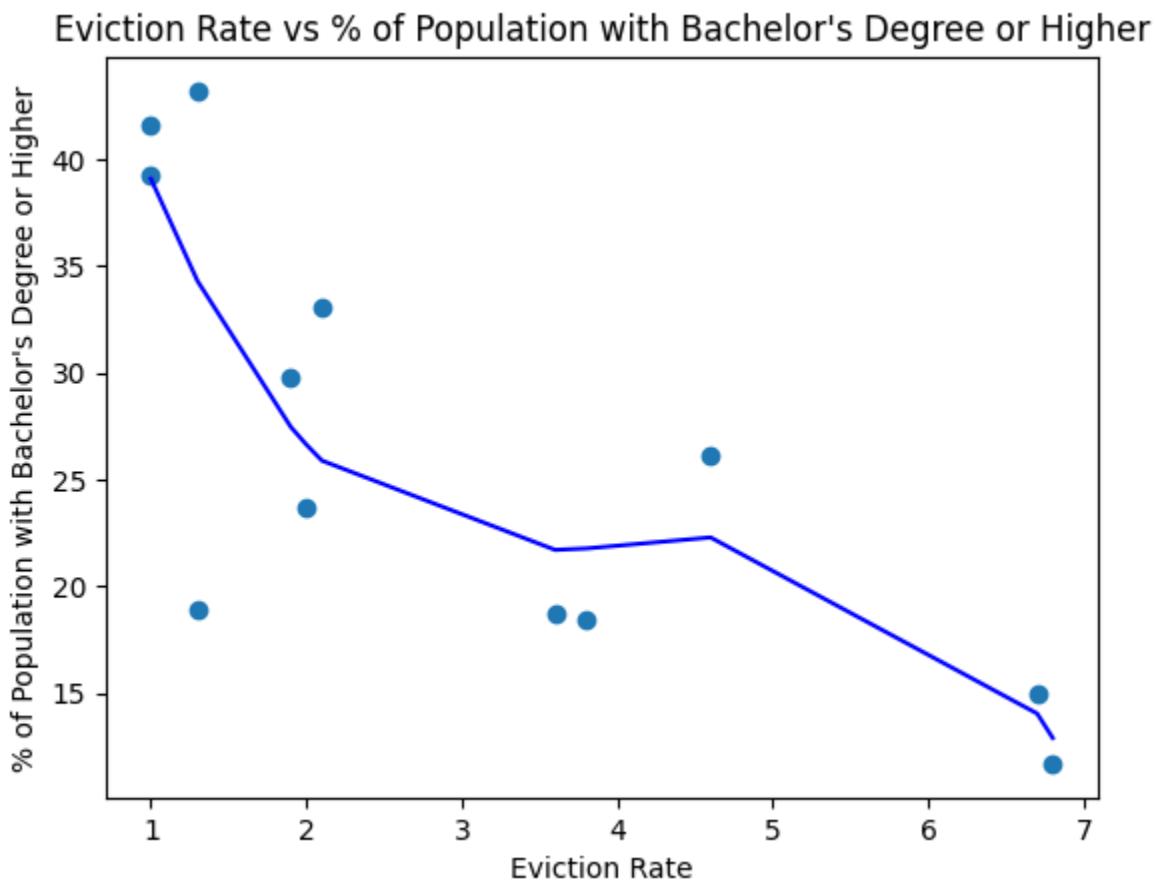


Education

Our analysis also revealed that Eviction rates show a strong downwards trend as the proportion of people with a bachelor's degree or higher increase in a neighborhood.

This could be attributed to several factors:

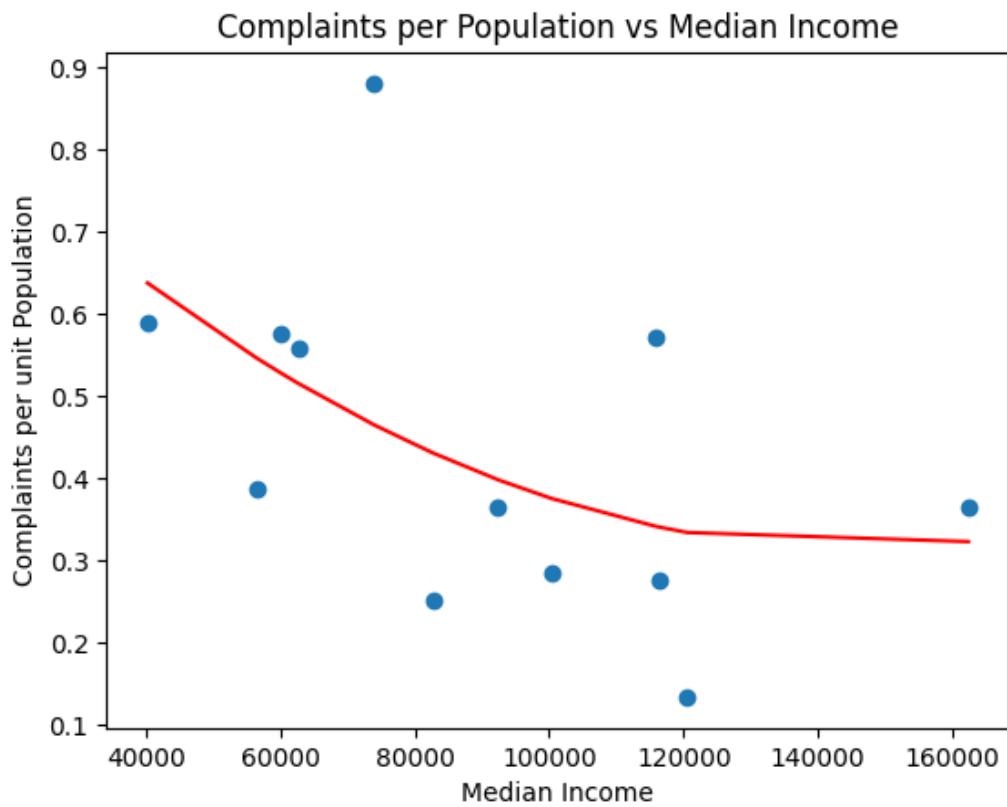
1. Do people with a Bachelor's degree or higher typically earn higher incomes than those with lower levels of education, and how does this impact their ability to afford housing costs and reduce the risk of eviction?
2. How does having a higher level of education contribute to job stability, and how does this stability help individuals consistently meet their financial obligations, such as rent or mortgage payments?
3. Why might landlords perceive tenants with higher levels of education as more reliable and responsible, and how does this perception lead to more favorable lease terms and a lower likelihood of eviction?

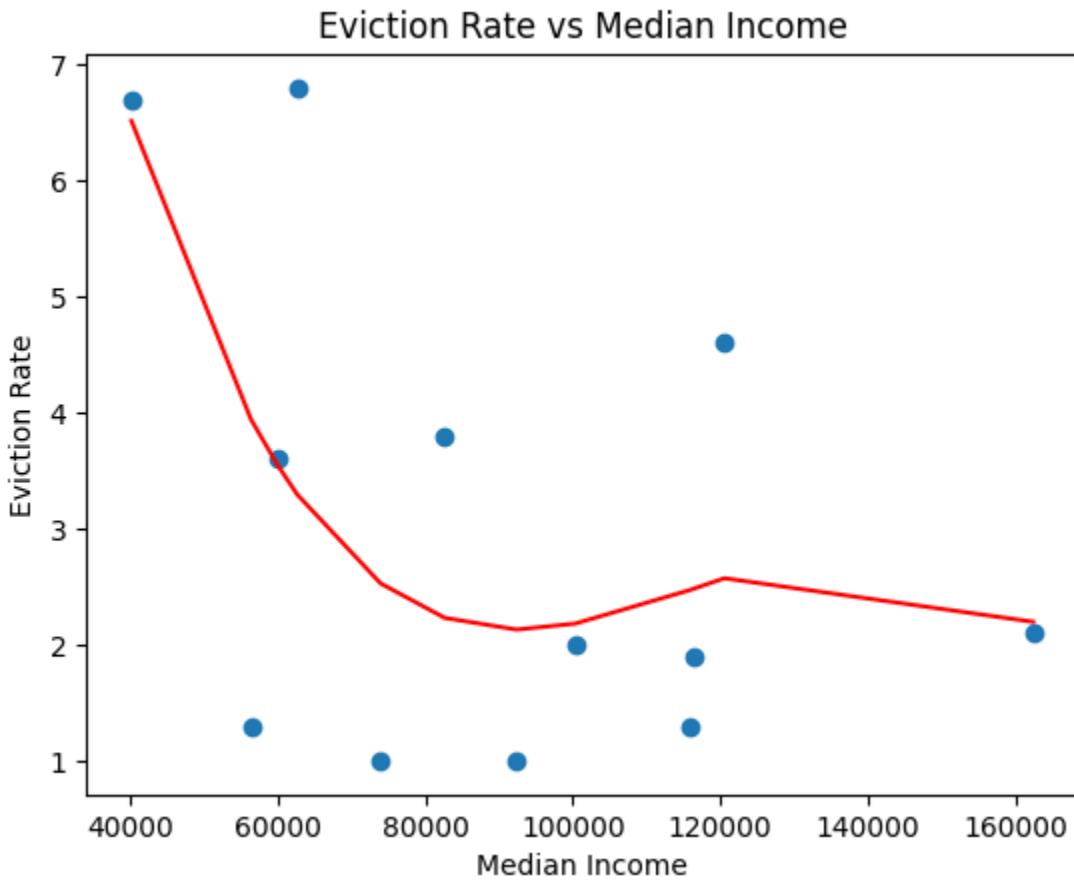


Income

Both eviction rates and complaints show a downward trend in neighborhoods with higher median incomes.

1. How do higher median incomes in neighborhoods relate to the downward trend in eviction rates and complaints, and how does affordability play a role in reducing the risk of eviction due to missed rent or mortgage payments?
2. In what ways do neighborhoods with higher median incomes typically have better quality housing and more responsive landlords or property managers, and how does this lead to fewer complaints from residents?
3. How does investment in community resources and public services contribute to a better overall living environment in higher-income neighborhoods, and can this result in fewe complaints related to neighborhood conditions or public services?

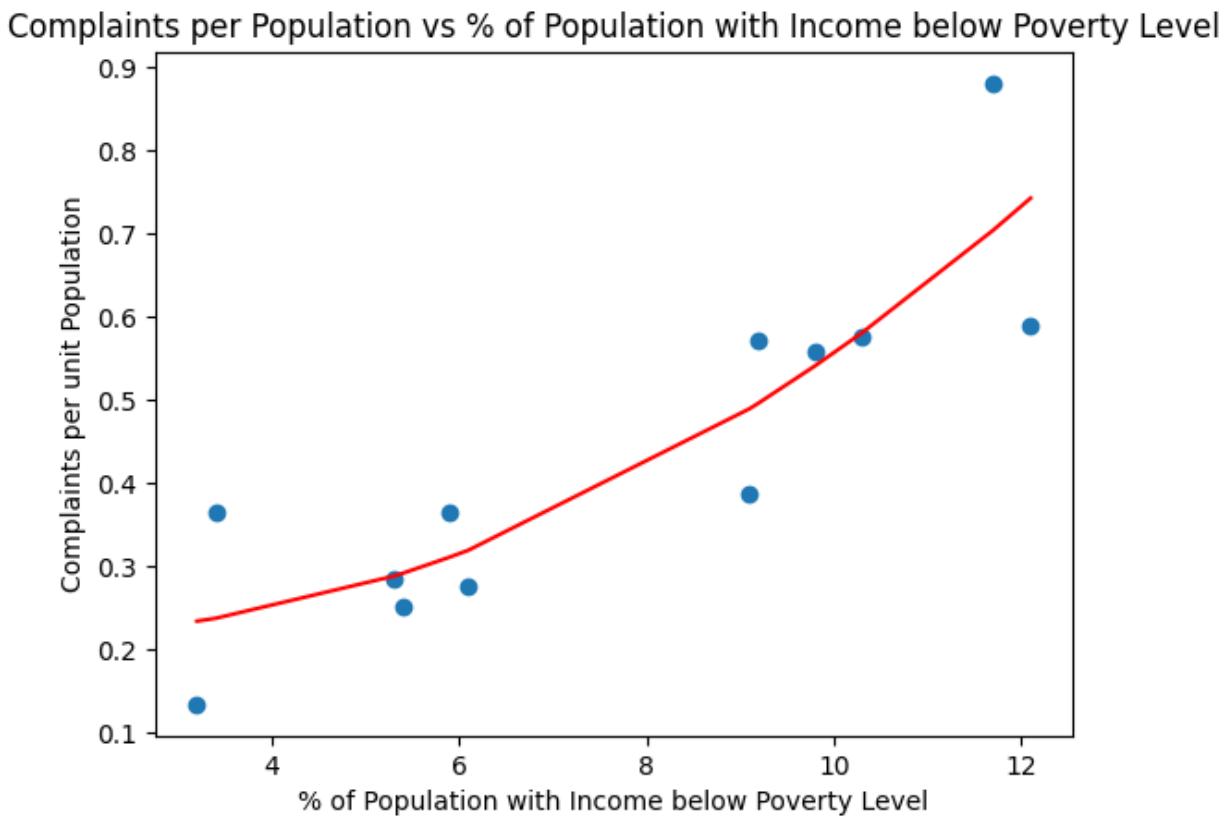




However, we also notice an increase in the number of complaints as the proportion of people below poverty levels in a neighborhood increases. This could be attributed to several factors:

1. How does the increase in the number of complaints relate to the proportion of people below poverty levels in a neighborhood, and how do limited resources to address housing issues contribute to this increase?
2. Why are people with incomes below the poverty level more likely to live in lower-quality housing, and how do issues like inadequate heating and plumbing problems result in a higher number of complaints?

3. In what ways are landlords or property managers in lower-income neighborhoods less responsive to tenant concerns, and how does this lead to unresolved issues and an increase in complaints?
4. How does insufficient investment in public services like sanitation, public transportation, and infrastructure maintenance impact lower-income neighborhoods, and how does this lack of adequate public services contribute to more complaints from residents?

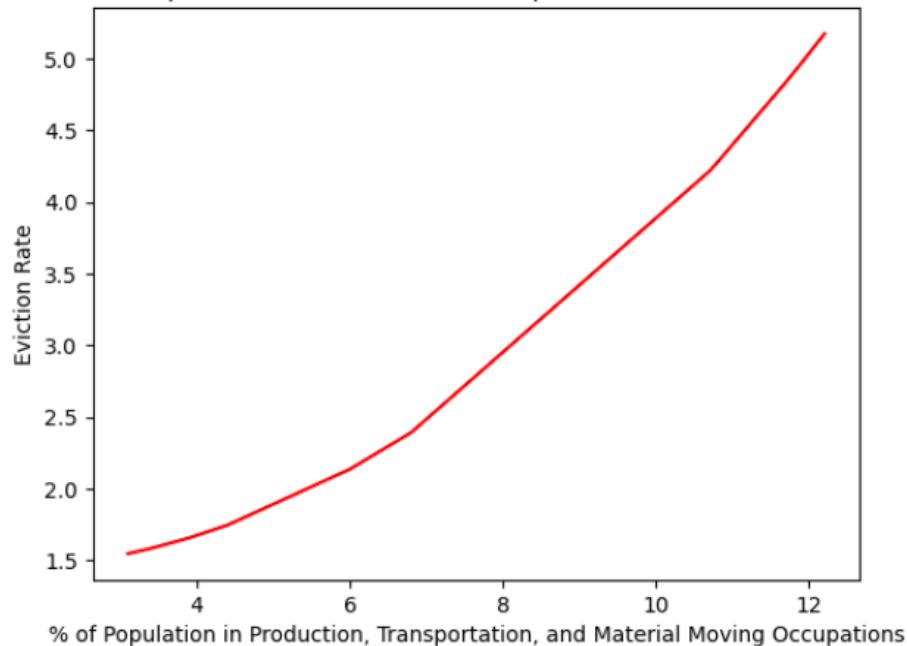


Profession

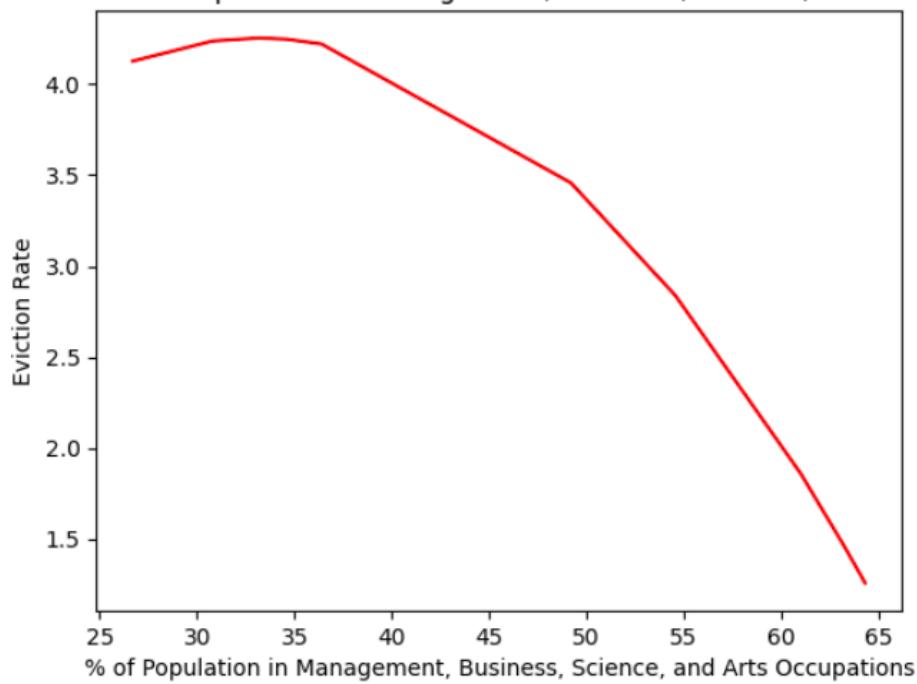
It was seen that the eviction rate was very high for people in professions like Production, Transportation, and Material Moving, while very low for professions like Management, Business, Science, and Arts. It can be attributed to the latter group having more stable jobs with higher incomes giving them income security

and allowing for timely payments and maintenance, thus mitigating the risk of eviction.

Eviction Rate vs % of Population in Production, Transportation, and Material Moving Occupations



Eviction Rate vs % of Population in Management, Business, Science, and Arts Occupations



Conclusion

In conclusion, our analysis of housing complaints, evictions, and related factors across neighborhoods provides valuable insights into the underlying factors influencing housing stability and landlord-tenant relationships. We found a strong positive correlation between the complaints per neighborhood and the percentage of housing units that are rented but not occupied, which could be attributed to factors such as lower quality of life, poor property management, and the presence of short-term rentals.

Our extension project explored the impact of socio-economic factors on eviction rates and identified age, education, income, and profession as significant contributing factors. These insights can be used to develop targeted interventions, inform policy decisions, and ultimately improve housing conditions in affected neighborhoods.

Questions:

This project aims to answer the following questions:

1. What are the most common types of housing violations and complaints in different neighborhoods?
2. Which landlords or property management companies have the highest number of recorded violations?
3. Is there a correlation between housing maintenance code violations and using evictions to harass tenants?
4. What factors might explain the increase in complaints in a neighborhood along with an increase in the percentage of rented but not occupied properties?
5. How do certain socio-economic factors, such as age, income, education, and profession, affect eviction rates in neighborhoods?
6. What insights can be drawn from the relationship between socio-economic factors and eviction rates to develop targeted interventions and inform policy decisions for improving housing conditions in affected neighborhoods?

Answers:

Based on the analysis presented, here are the answers to the questions:

1. The most common types of housing violations and complaints in different neighborhoods are enforcement violations, housing complaints, and sanitation requests. Within enforcement violations, improper disposal of trash, overfilling dumpsters, and overgrown vegetation on properties are the most common.
2. The project identifies the landlords or property management companies with the highest number of recorded violations. The specific names of these landlords or companies are not provided in the given information.
3. The project found a very slight negative correlation between complaints per population and annual eviction filing rate, which indicates that we cannot conclude

anything about utilizing evictions to harass tenants. However, there was a strong positive correlation between complaints per neighborhood and the percentage of housing units that are rented but not occupied.

4. An increase in complaints in a neighborhood alongside an increase in the percentage of rented but not occupied properties could indicate:

a. Lower quality of life due to issues like noise, crime, and litter.

b. Poor property management leading to tenant dissatisfaction and higher turnover rates.

c. Growing presence of short-term rentals or vacation properties (e.g., Airbnb) causing intermittent occupancy and increased complaints from residents.

5. Socio-economic factors like age, income, education, and profession do affect eviction rates in neighborhoods. For example, eviction rates decrease as the proportion of the population aged 20-34 or the proportion of people with a bachelor's degree or higher increases. Additionally, eviction rates and complaints show a downward trend in neighborhoods with higher median incomes.

6. Insights drawn from the relationship between socio-economic factors and eviction rates can be used to develop targeted interventions and inform policy decisions for improving housing conditions in affected neighborhoods. For example, policies and programs can be designed to support economic stability, improve property management, and provide resources for addressing housing issues in low-income neighborhoods.

Division of Tasks:

Harshil Gandhi:

Harshil worked on the 311 complaints data and the property assessment data. They analyzed the data and tried to find a relationship between the two datasets. He also worked on the extension project and analyzed the relationship between evictions/complaint volume and various socioeconomic factors for different neighborhoods in Boston.

Abhishek Tiwari:

Abhishek also worked on the 311 complaints data and the violations data. They worked on normalizing the dataset for further analysis. They also worked on the extension project and analyzed the relationship between evictions/complaint volume and various socioeconomic factors for different neighborhoods in Boston, this included the regression analysis of the complaints/evictions data with the socioeconomic factors for different neighborhoods in Boston.

Di Wang:

Di worked on the spatial analysis of the 311 complaints data and the violations data. They also worked on the extension project and analyzed the relationship between evictions/complaint volume and various socioeconomic factors for different neighborhoods in Boston. Finally, they put together the final report and presentation for the project.

Longdan Mao:

Longan worked on the spatial analysis of the violations dataset, exploring neighborhood level trends in violations. They also worked on the extension project and analyzed the relationship between evictions/complaint volume and various

socioeconomic factors for different neighborhoods in Boston. Finally, they put together the final report and presentation for the project.