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Deliverable 3

City of Cambridge Eviction Cases

Original Project Description

Over the past two years, the City of Cambridge has been collecting and analyzing eviction data from the State of Massachusetts online court docket system. This project includes three phases of work that improve and enhance data collection and analysis procedures:

1. Update the current Python data scraping script to address both additional data collection needs and privacy concerns under discussion with our Law department.

2. Automate the data cleaning process to the extent possible.

3. Link eviction data to other data sources, such as city master address list, assessing data, American Community Survey, housing code violations, and market rate rental housing prices to gather actionable insights.

Goals of the project are twofold. We seek to update and optimize our data collection and analysis procedures. We also seek to explore research questions to obtain a better understanding of under what conditions evictions occur in the market rate housing stock and potentially where they might occur in the future

Goals

This project had three main goals:

1. Optimize data collections. To combine data from many different resources, this project seeks to optimize the process by using python script

2. Optimize analysis process by using the some commonly used methodology and algorithm in data science

3. Obtain a better understanding of under what conditions evictions occur in the market rate housing stock and potentially where they might occur in the future

Challenges

Several challenges were faced throughout the course of this project:

1. Our main customer, the City of Cambridge, suddenly abandoned the project and revoked access to the eviction data that they had previously provided.

2. The Massachusetts Court Docket forbids automatic web scraping. The court website explicitly displays a warning against using automatic scrapers and crawlers to gather data.

3. The Covid-19 pandemic created the greatest challenges for the project. Boston University decided to suspend all in-person meetings and required students to vacate on-campus residences in the middle of the semester. The virus and the University's decision brought about a tremendous disruption to the project because the members had to focus on adjusting to these changes, moving out of campus, and re-coordinating our group schedule.

Datasets

The data used in this project was gathered from several sources.

Main dataset

The main data is gathered from [Massachusetts Court Docket](#)

Collection:
      The data was retrieved manually by downloading the html file of each case to a local machine. The downloaded pages were then processed using python script to collect all data of interest. Manually downloading of each detail page of the eviction case was required due to the legal warning of the website which prohibited the use of scrapers to query the website.

      Eviction cases in the City of Cambridge between January 2017 and February 2020 were collected.

Features:

Feature	Value	Type
Case Number	Court case number	alpha-numeric string
Status	Status of case - Open, Closed, or Disposed	string
File Date	mm/dd/yyyy	string
Plaintiff	Party filing for eviction	string
P-Attorney	Name of attorney representing the plaintiff	string
Defendant	Name of the defendant (person risking eviction)	string
D-Attorney	Name of attorney representing the defendant	string
Property Address	Full address the case concerns	string
Docket	Details of case proceedings	string
Judgment Date	Date of judgment decision; mm/dd/yyyy	string
Judgment Type	Result of the case	string
Judgment Method	Settled or dismissed, and compromise	string
Judgment Total	Total dollar amount to be paid, usually from defendant to plaintiff	float
Execution Total	Actual total dollar amount due (including court fees and interest)	float
Latitude, Longitude	Geographic coordinates corresponding to the address	float
Units	Number of apartment units in the building at the corresponding address	float
District	Neighborhood within Cambridge which the address belongs to	String
Address	Standardize address to use as indicator to map with other data source such as housing_stat	String
median_income	The median income based on the neighborhood	float

Secondary datasets

1. The [Cambridge Neighborhood Polygon](#) dataset was used to draw the boundaries of each district in cambridge on the plot of geographic location of datapoints.

2. Google Maps and Open Map were used to retrieve the geographic coordinates of each address. Together with neighborhood polygon data, this data was used to determine within which neighborhood each property was located.

3. The [Housing Starts Map](#) dataset provides a table of all residential building permits in Cambridge. From this data, the number of units within some buildings was able to be determined.

4. The [American Community Survey](#) dataset provides estimated median income for each neighborhood in Cambridge, drawn from years 2013 through 2017.

5. [Public](#) [housing](#) [databases](#) were used to identify affordable housing in Cambridge.

Project folder

Folder	Description
src	Folder that contain all python files
Analysis	Folder that contain the result of analysis such as Power BI chart and HTML page of the map created by using folium
CSV	Folder that contains the csv files. Csv created from scraping and other csv files and geojson files from Cambridge open data
Data	Folder that contains the html pages that we manually downloaded from the massachusett court

Limitation and Assumption

1. We assume that all cases of eviction go through the mass court.
2. We are unable to get an individual profile of the tenants. For the income we use the median income of the district as the proxy to infer the tenants individual income. Other defendant attributes (such as gender) were determined using a classification algorithm, typically a built-in Python package.
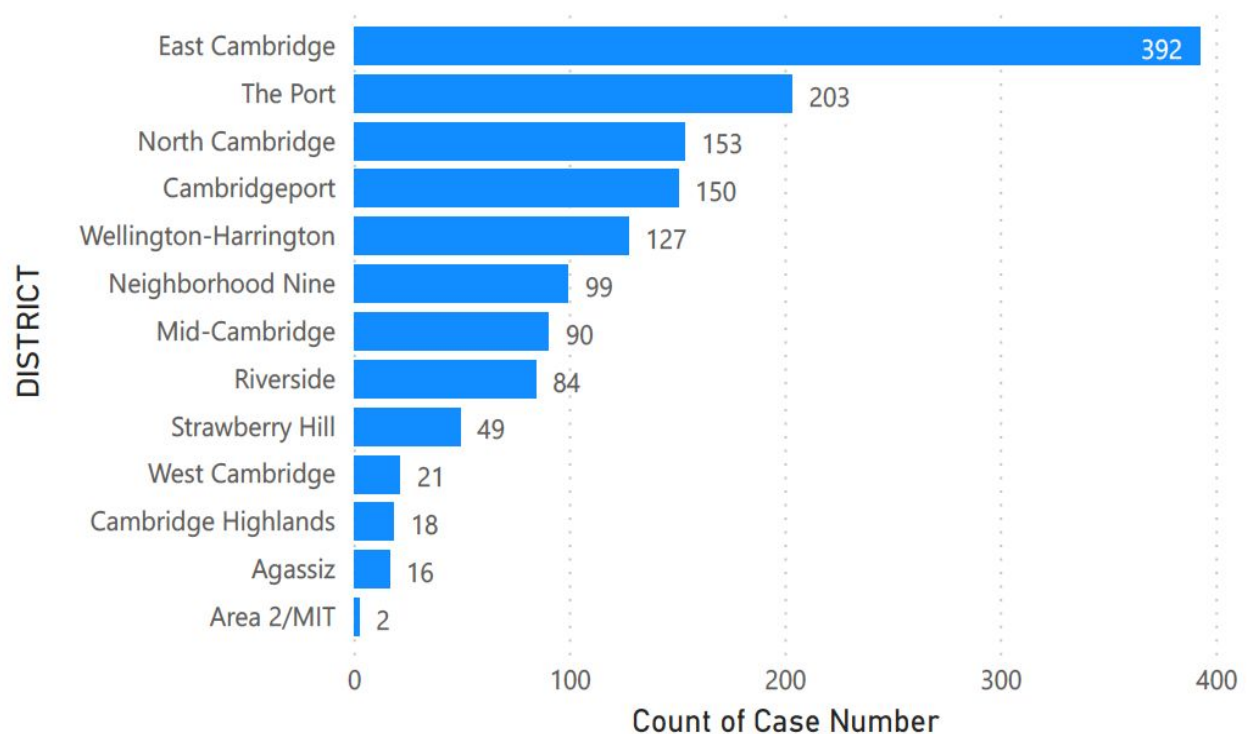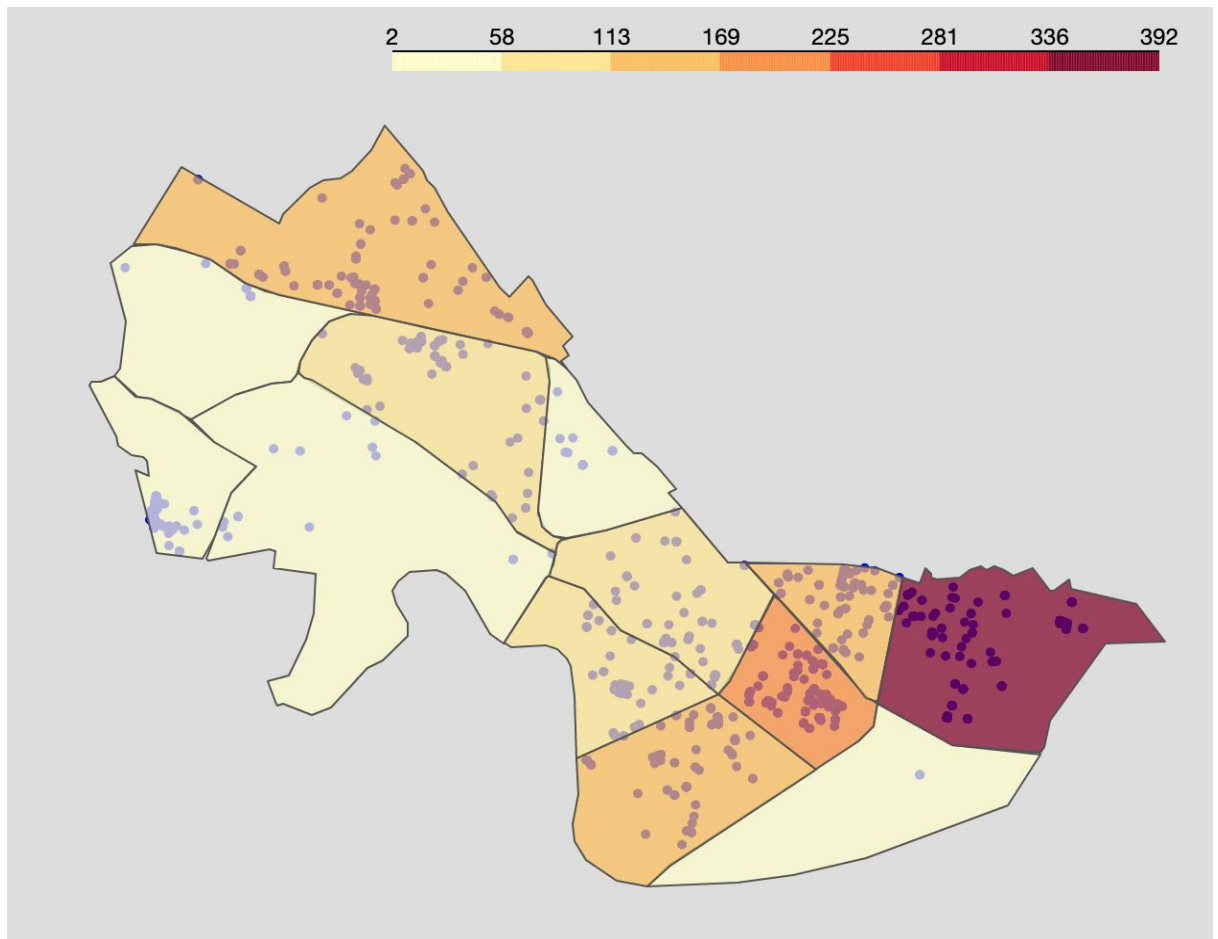
Analysis and Findings

The data contains 1404 cases of eviction which were brought to court between 2017 and 2020.

Eviction Cases By District

A majority of cases occurred in East Cambridge as depicted in the figure below. Almost a quarter of all eviction cases involved a resident of East Cambridge.

Count of Case Number by DISTRICT

The map produced above can be found at analysis/map.html

Eviction Cases by Income

Since we are unable to get the specific income of the individual tenant or the defendants, we use median income of each neighbourhood that is published in the Cambridge open data portal to measure the cases of eviction across income brackets.

The data shows us that the majority of the cases happen to people with median income between 80,000 dollars and 95,000 dollars. One possible explanation for this, the people in this bracket might be too rich to receive subsidy or government help while not rich enough to be able to afford the housing.
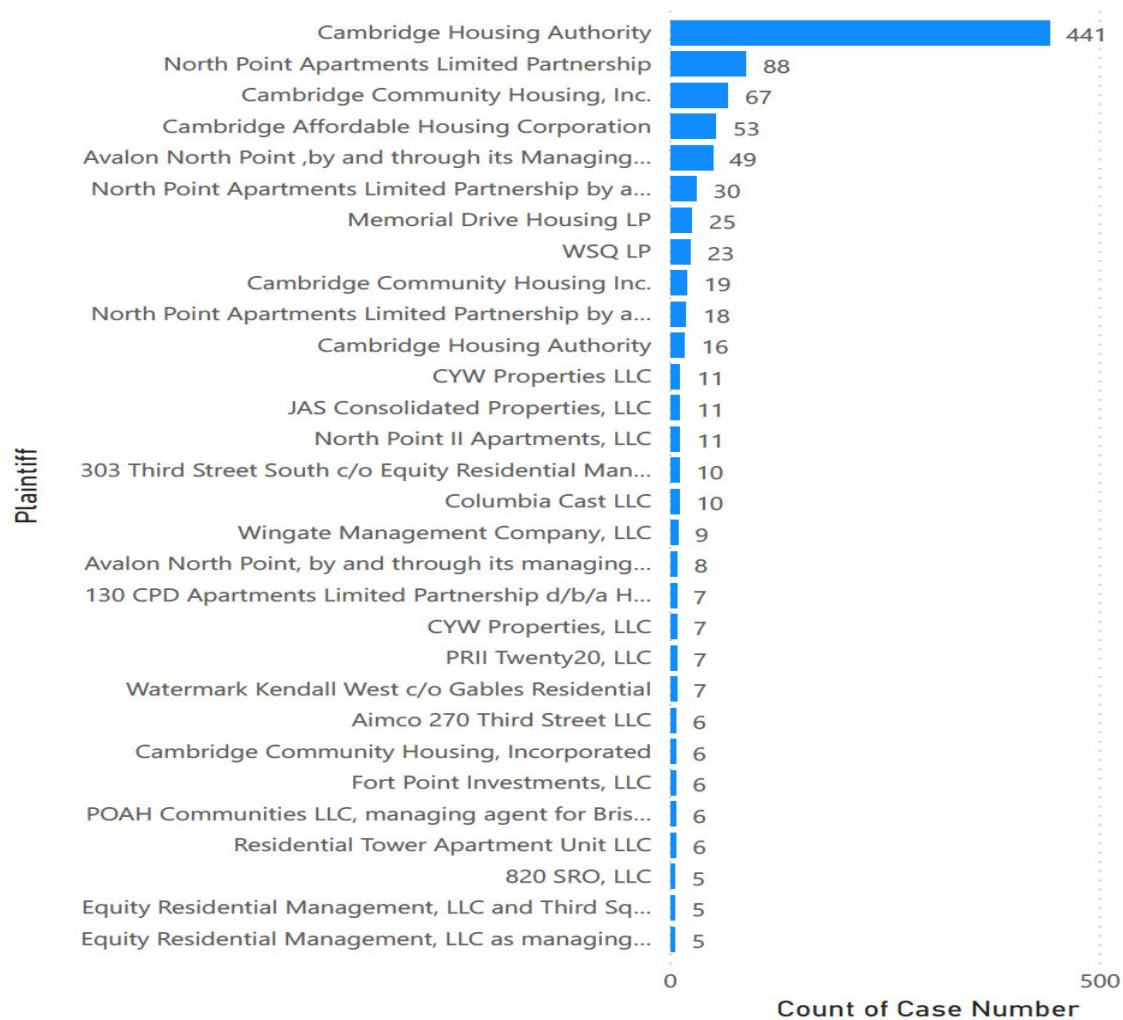
Count of Case Number by median_income
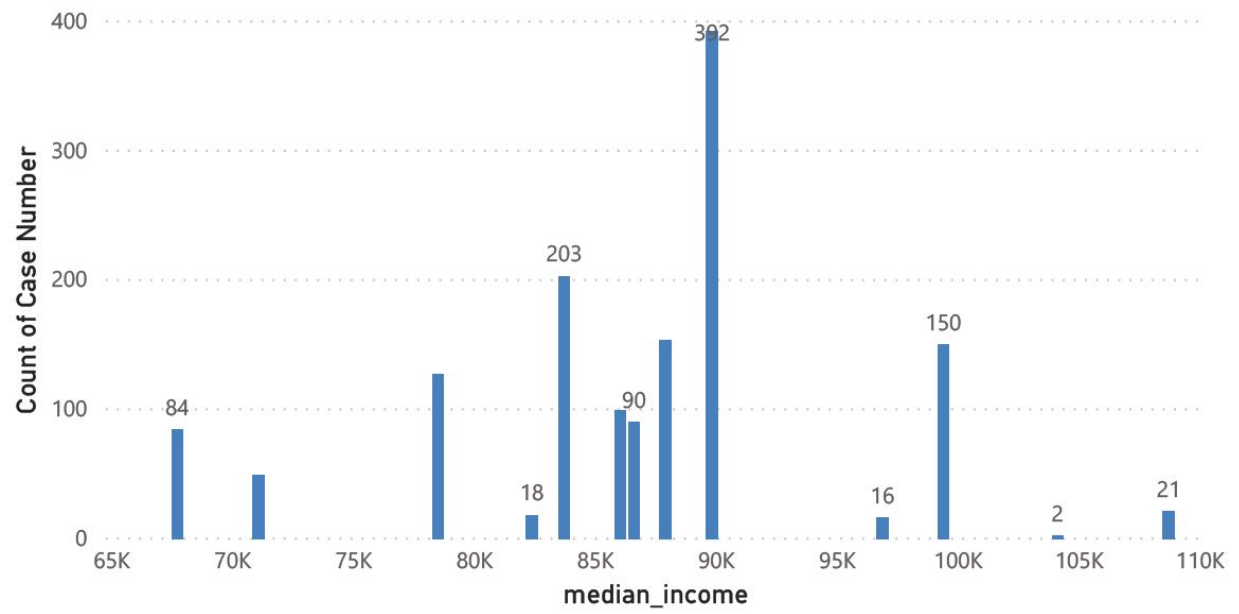
Eviction Cases By Plaintiff

Most eviction cases occurred in the property owned by cambridge housing authority. This is not surprising because Cambridge Housing Authority is the organization that mainly provides housing for lower income residents.

Count of Case Number by Plaintiff

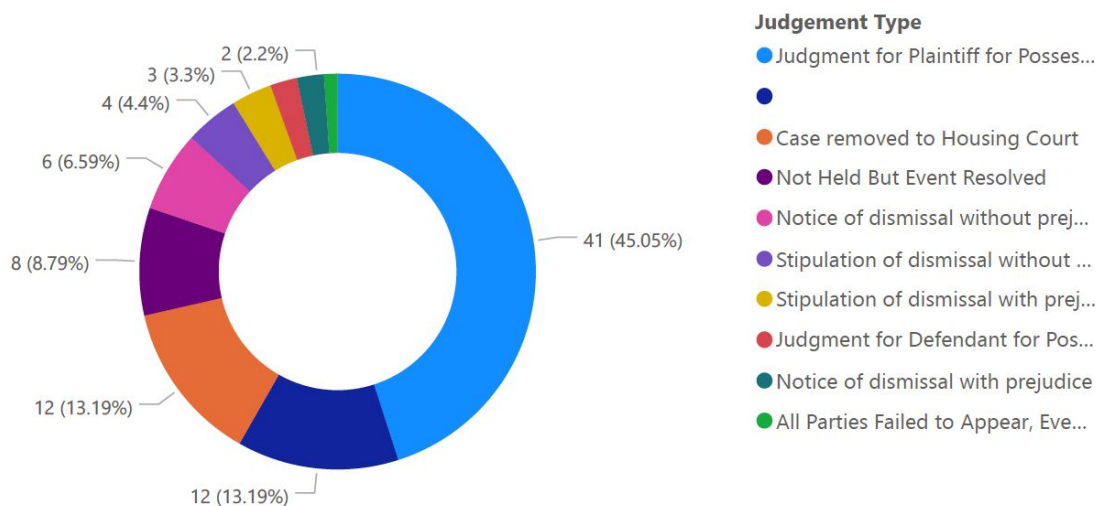| Plaintiff	Count of Case Number
Cambridge Housing Authority	441
North Point Apartments Limited Partnership	88
Cambridge Community Housing, Inc.	67
Cambridge Affordable Housing Corporation	53
Avalon North Point ,by and through its Managing...	49
North Point Apartments Limited Partnership by a...	30
Memorial Drive Housing LP	25
WSQ LP	23
Cambridge Community Housing Inc.	19
North Point Apartments Limited Partnership by a...	18
Cambridge Housing Authority	16
CYW Properties LLC	11
JAS Consolidated Properties, LLC	11
North Point II Apartments, LLC	11
303 Third Street South c/o Equity Residential Man...	10
Columbia Cast LLC	10
Wingate Management Company, LLC	9
Avalon North Point, by and through its managing...	8
130 CPD Apartments Limited Partnership d/b/a H...	7
CYW Properties, LLC	7
PRII Twenty20, LLC	7
Watermark Kendall West c/o Gables Residential	7
Aimco 270 Third Street LLC	6
Cambridge Community Housing, Incorporated	6
Fort Point Investments, LLC	6
POAH Communities LLC, managing agent for Bris...	6
Residential Tower Apartment Unit LLC	6
820 SRO, LLC	5
Equity Residential Management, LLC and Third Sq...	5
Equity Residential Management, LLC as managing...	5

Eviction Cases by Judgement Type

Defendant represented by attorney vs. no representation

Although there were only 91 cases out of 1404 (less than 6.5%) in which the defendant was represented by an attorney, the outcome for the defendant was better when they were represented by an attorney as opposed to when they were not represented by an attorney.
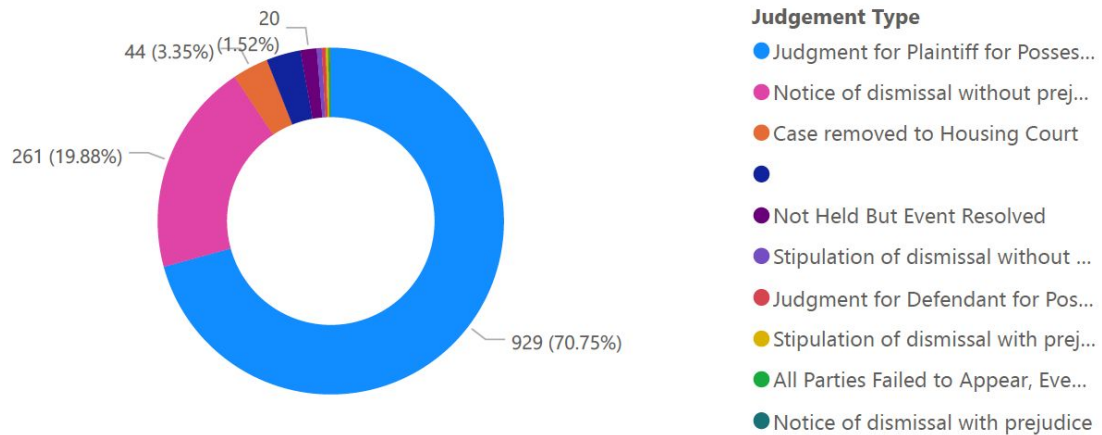
When the defendant was represented by an attorney, only 45% of cases resulted in Judgment for Plaintiff:

Count of Case Number by Judgement Type When the Defendant is represented by a lawyer

Judgement Type
- Judgment for Plaintiff for Posses...
-
- Case removed to Housing Court
- Not Held But Event Resolved
- Notice of dismissal without prej...
- Stipulation of dismissal without ...
- Stipulation of dismissal with prej...
- Judgment for Defendant for Pos...
- Notice of dismissal with prejudice
- All Parties Failed to Appear, Eve...

2 (2.2%)
3 (3.3%)
4 (4.4%)
6 (6.59%)
8 (8.79%)
12 (13.19%)
12 (13.19%)
41 (45.05%)

When the defendant was not represented by an attorney, the percentage of cases that resulted in Judgement for Plaintiff increased to 70% of cases:
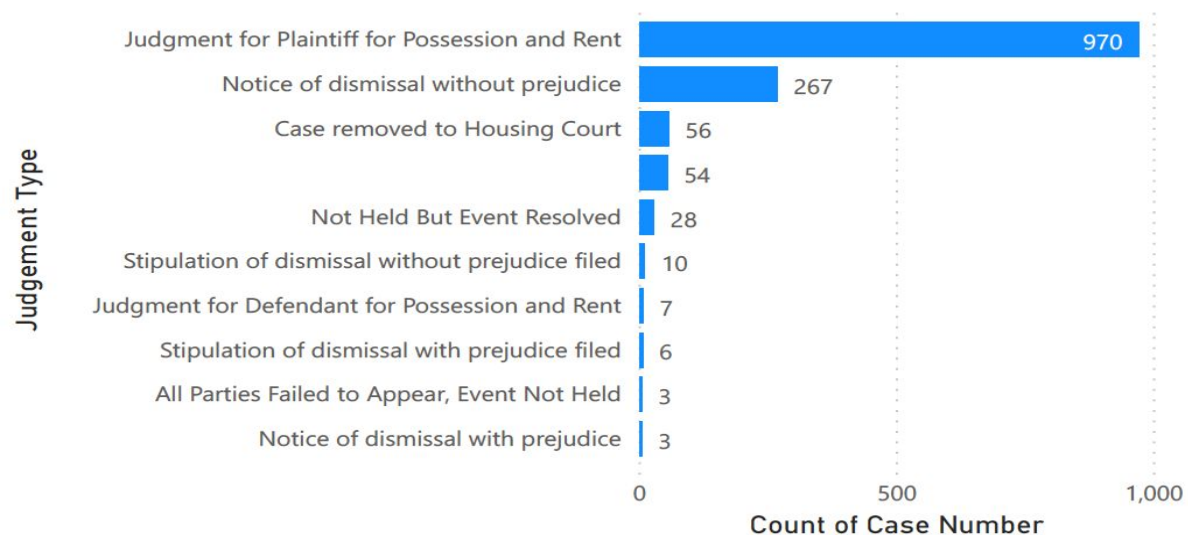
Count of Case Number by Judgement Type when the Defendant does not have a lawyer

Judgement Type
- Judgment for Plaintiff for Posses...
- Notice of dismissal without prej...
- Case removed to Housing Court
-
- Not Held But Event Resolved
- Stipulation of dismissal without ...
- Judgment for Defendant for Pos...
- Stipulation of dismissal with prej...
- All Parties Failed to Appear, Eve...
- Notice of dismissal with prejudice

20 (1.52%)
44 (3.35%)
261 (19.88%)
929 (70.75%)

Cases that went through trial by judge vs. no trial

The vast majority of cases (970 out of 1404) resulted in Judgement for the Plaintiff; there were only 14 cases that resulted in judgement for the defendant.

Count of Case Number by Judgement Type

Judgement Type	Count of Case Number
Judgment for Plaintiff for Possession and Rent	970
Notice of dismissal without prejudice	267
Case removed to Housing Court	56
	54
Not Held But Event Resolved	28
Stipulation of dismissal without prejudice filed	10
Judgment for Defendant for Possession and Rent	7
Stipulation of dismissal with prejudice filed	6
All Parties Failed to Appear, Event Not Held	3
Notice of dismissal with prejudice	3

However, when we drill down to the number of cases where the verdict came after trial by judge, the odds of a positive judgement for the defendant increased to 14% (1/7) from 0.5% (7/1404) considering all cases.

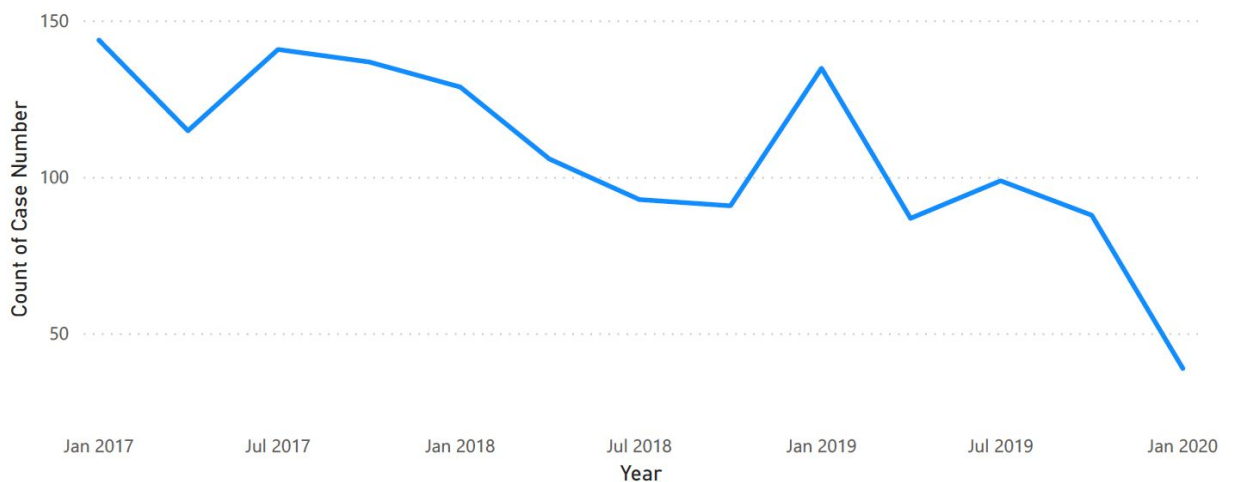The figure depicts the frequency of judgement types after trials by judge.
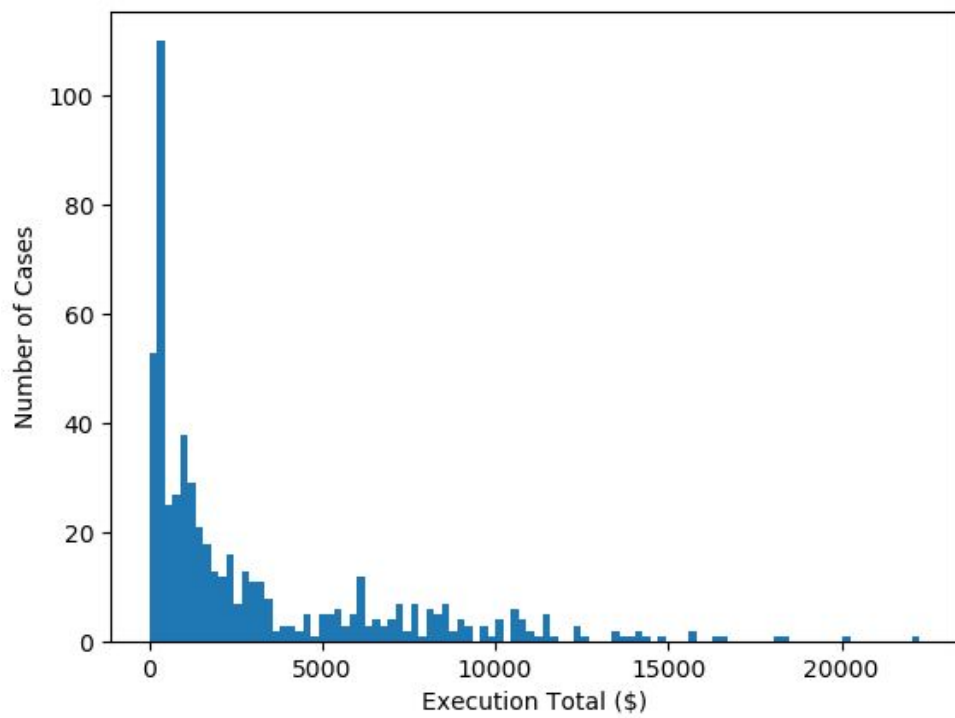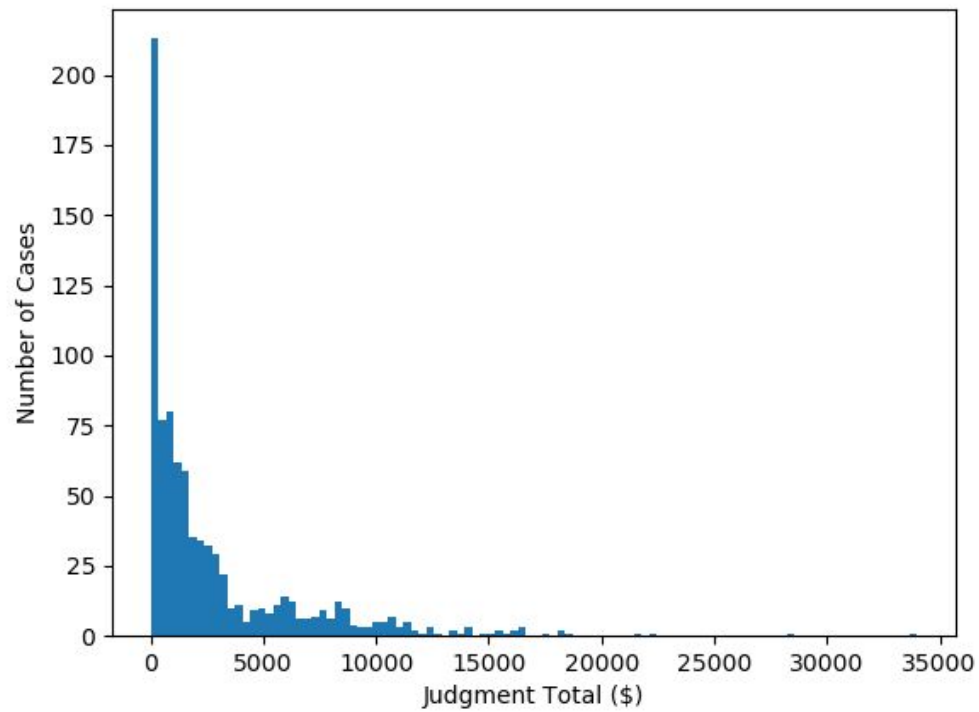

The trend of eviction cases

Over time the number of eviction cases reduce overtime. For 2020, the data is incomplete.
The possible explanation for this trend is the economic situation that has been trending positively for the past 10 years and the employment rate is keep coming down.

Histograms for the judgment totals and execution totals are shown below.

A histogram of the number of units is shown below.
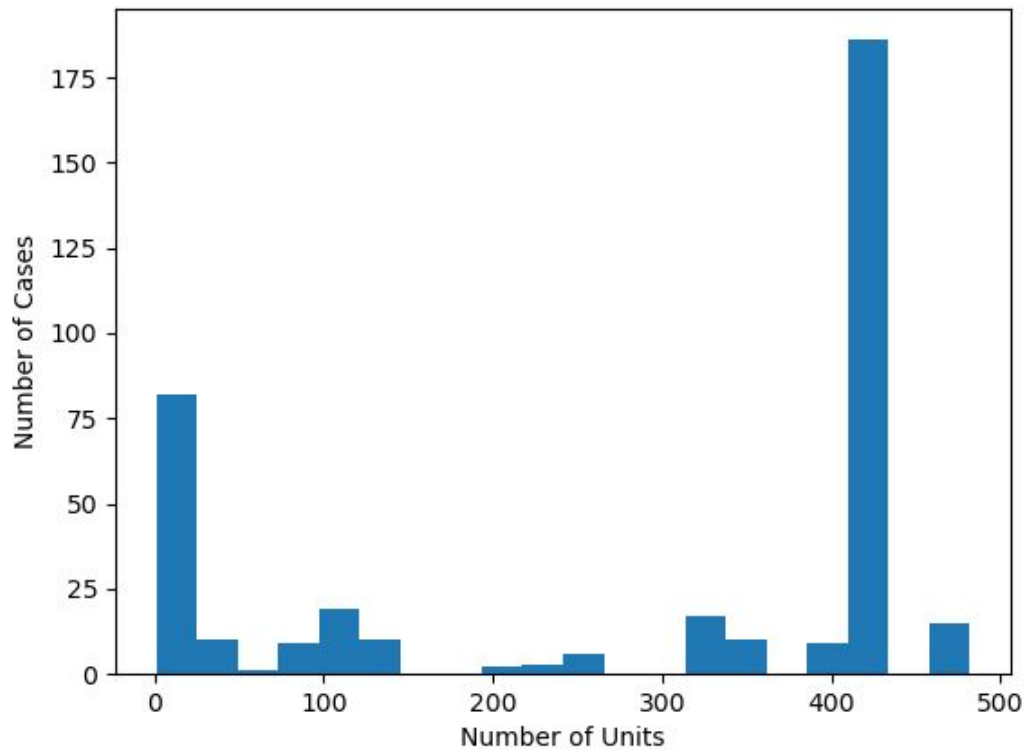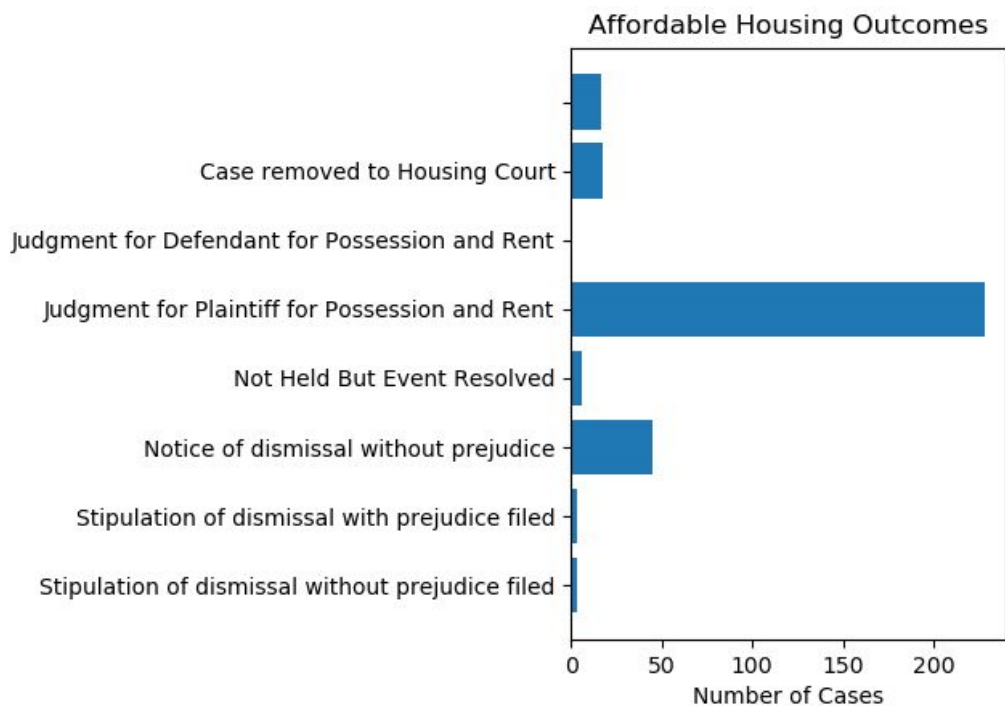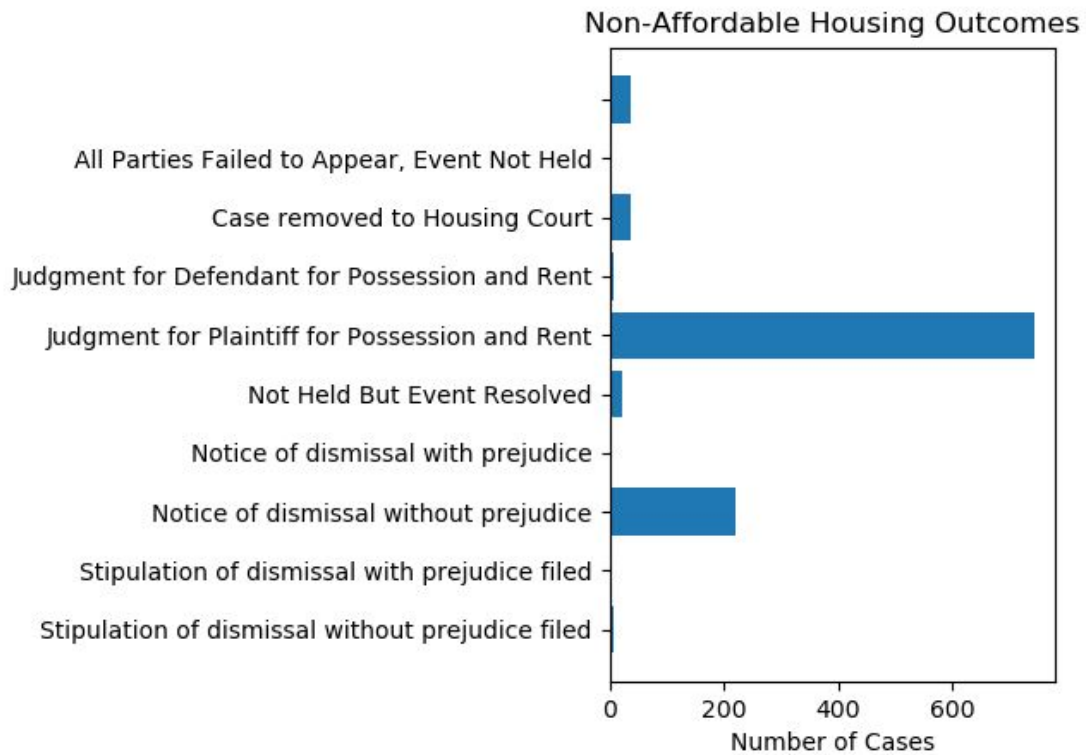

There are not any major differences between male and female outcomes.

Female Outcomes
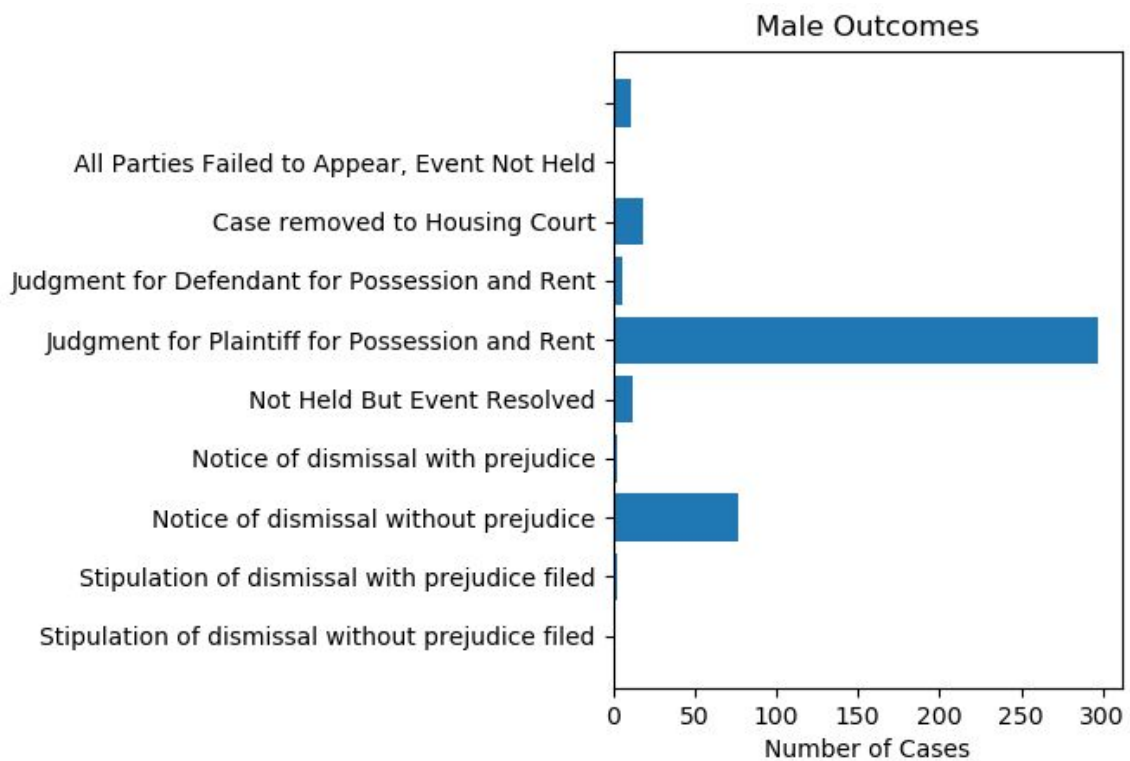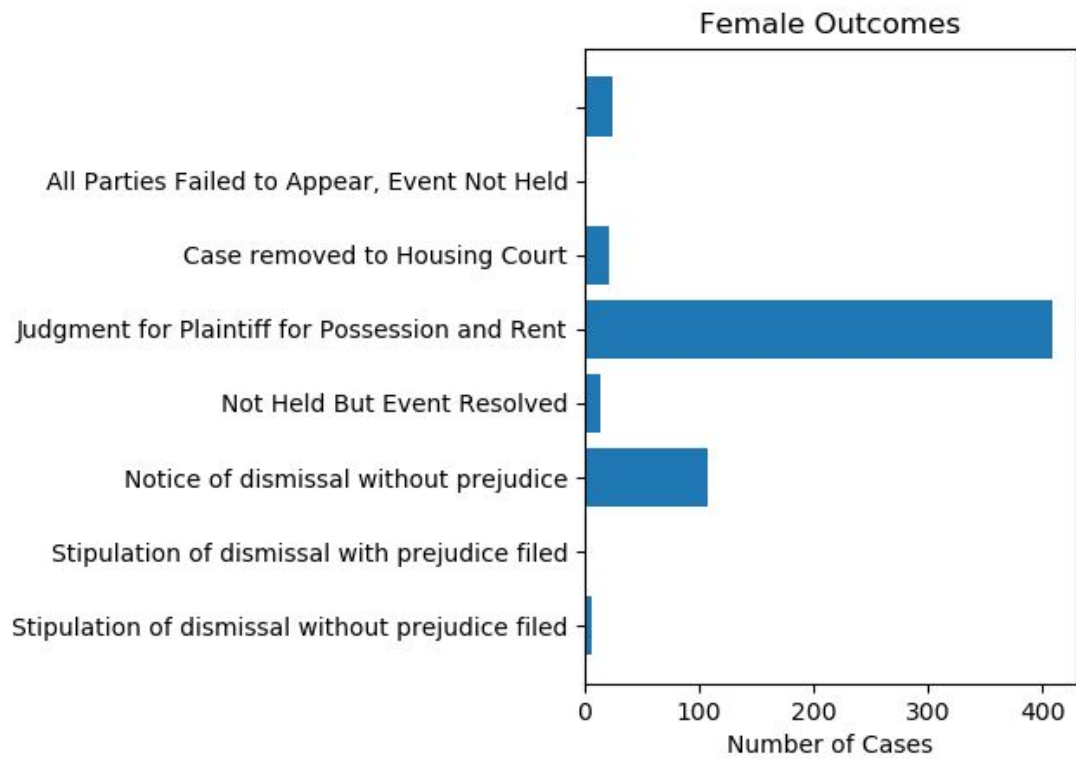
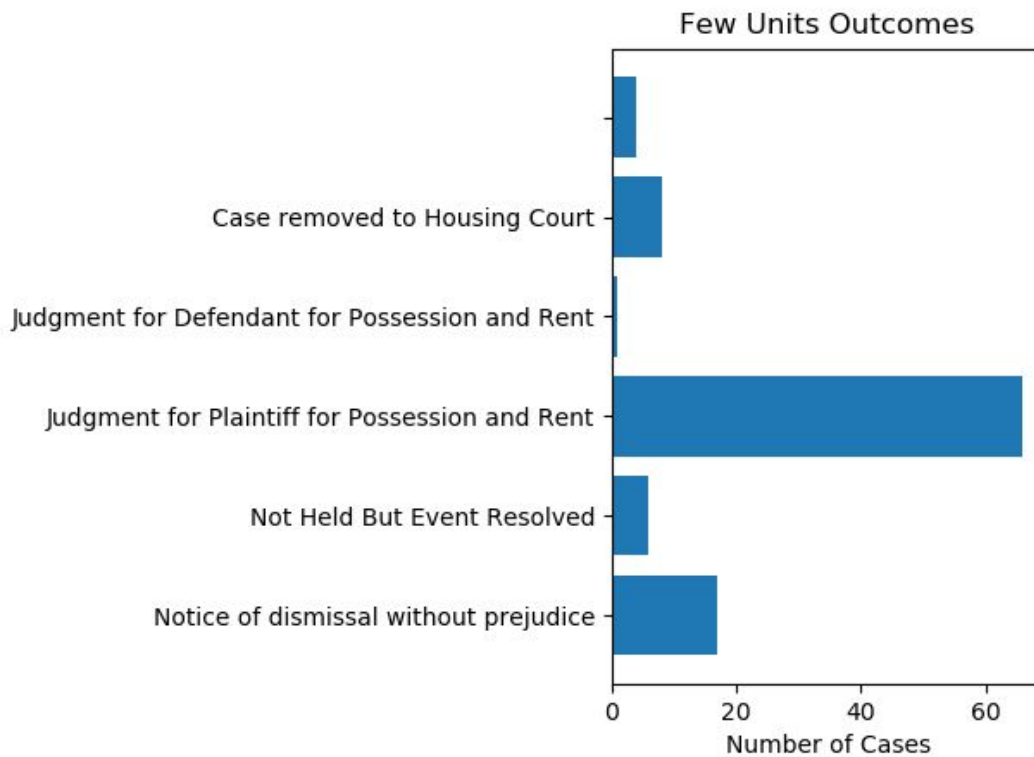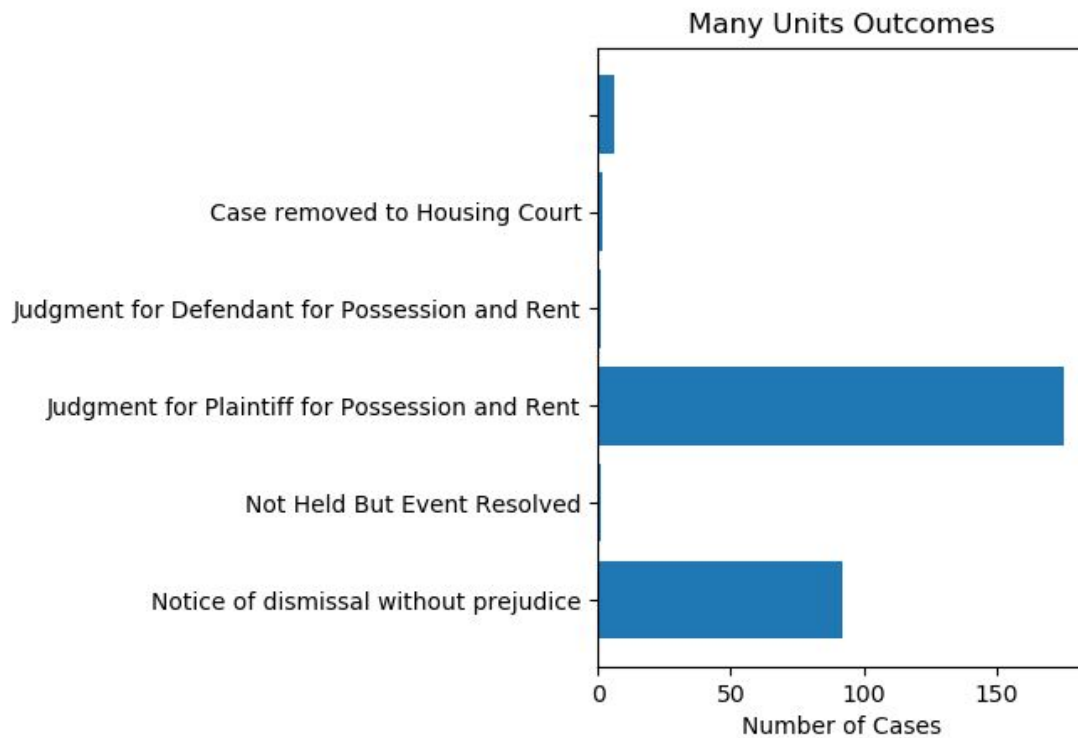There is a much higher rate of eviction for non-affordable housing units compared to affordable housing units.

Affordable Housing Outcomes

Non-Affordable Housing Outcomes

Buildings with a large number of units (>= 100) have a much higher rate of eviction than buildings with a small number of units (< 100).

Few Units Outcomes

Many Units Outcomes

Conclusions

By analysing the eviction cases in the city of cambridge from 2017 to beginning of 2020, we tried to understand the eviction cases in Cambridge. The most likely people that would face eviction cases in the city of Cambridge are the people who live in East Cambridge and The Port neighbourhood, stay in a property managed by Cambridge Housing Authority, and have median income that fall between 80K to 95K.

Future works

The research we did can be extended to build more comprehensive and detailed profiles of the tenants (defendants) and landlords (plaintiffs), which will give better explanations of the parties involved in the eviction cases.
The study can be extended to include records from more years in the past to get the time series trend of the eviction cases. The macro economic data such as employment, economic gdp increase rate could be included for the analysis