

An Analysis of New York City's Parking Violations for Fiscal Year 2022



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CSPB 4502 Data Mining

Introduction

Data set description: This dataset is composed of over 15.4 million parking violations issued by New York City for the 2022 fiscal year.

Questions sought to answer:

- Which streets or locations have the most number of parking tickets?
- What are the most common violation codes issued? Is there a correlation for certain types of vehicles?
- When during the year are most tickets likely to be issued?
- Which make of passenger vehicle is most likely to be ticketed?
- Which counties have the highest number of parking violations?

Data Preparation Work

CleanData.py

- Cleans the 'Street Names' and 'Violation County' columns
- 'Violation County' involved creating a dictionary to standardize names
- 'Street Names' required regex in order to capture different naming conventions and typos

CleanData_1.py

- Uses data reduction techniques to obtain a more lightweight dataset
- Removes columns with incomplete or unnecessary values

Tools Used

Python

- Numpy and Pandas libraries
- Matplotlib

Tableau

- Cleaning and visual design

Data Studio

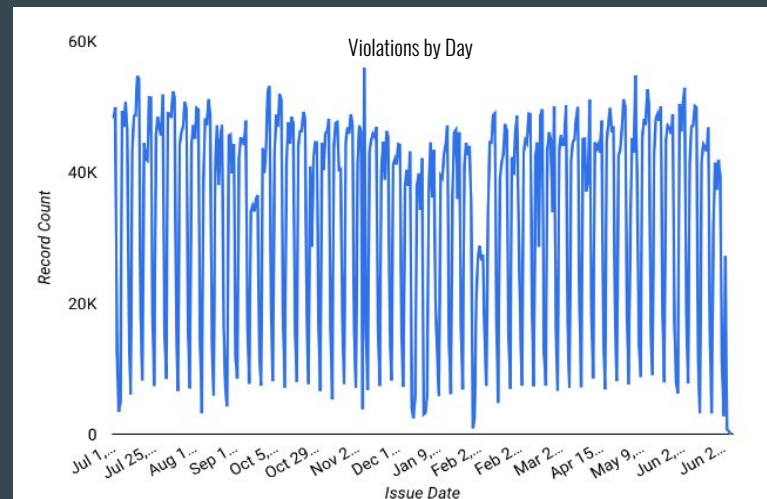
- Additional data visualizations

Github

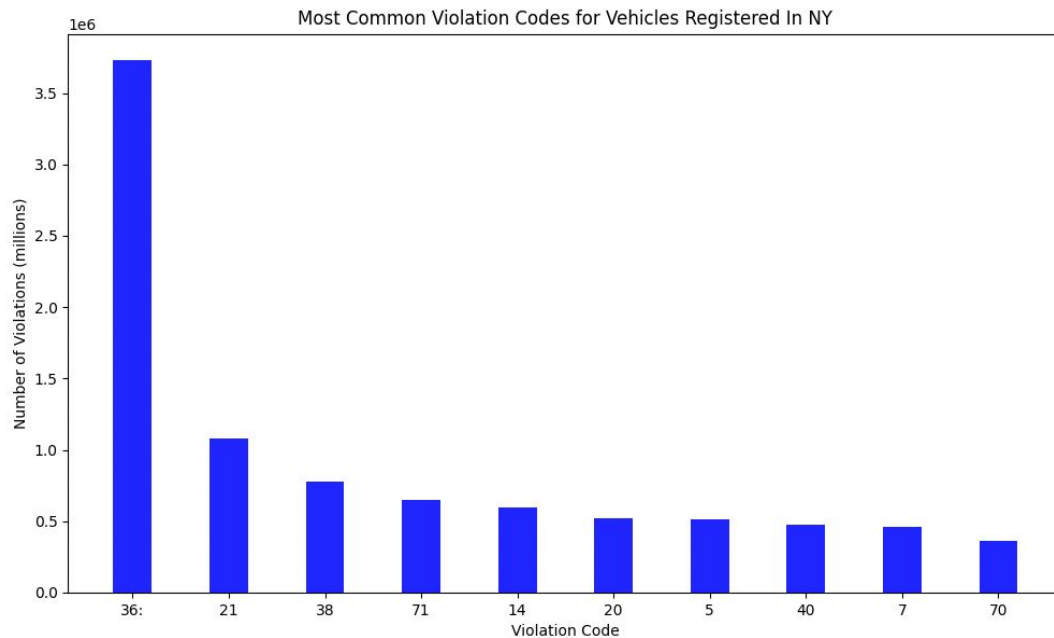
- Version tracking and turning in deliverables

Analysis: Violations By Date

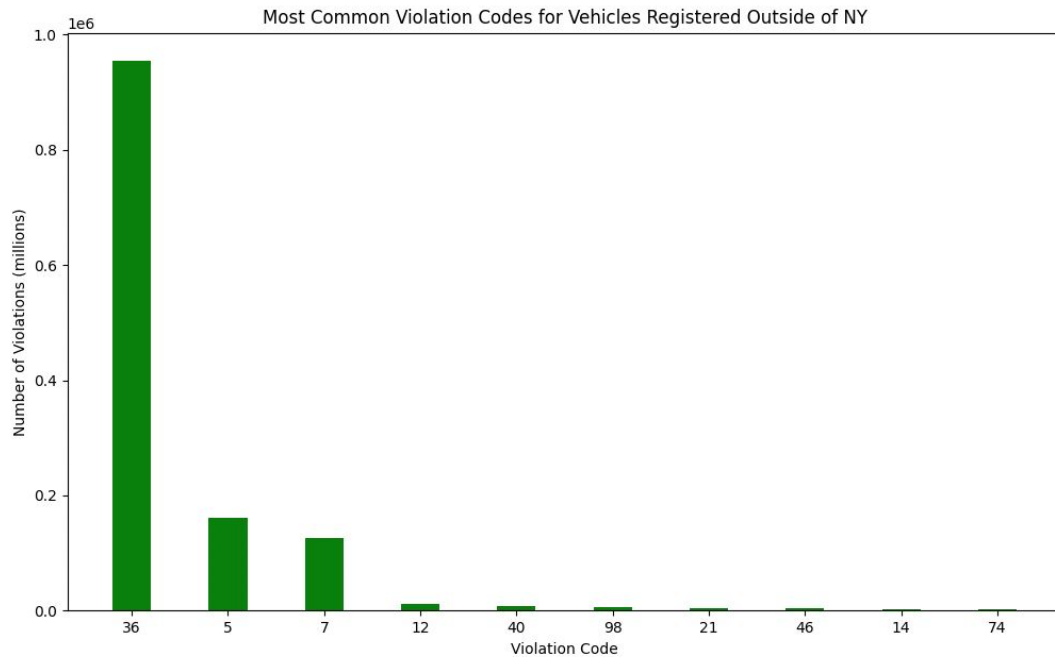
- Parking violations are enforced regularly throughout the year
- There is a predictable drop in parking violations on days that parking is not enforced (e.g. Sundays and holidays)



Analysis: Most Common Violations

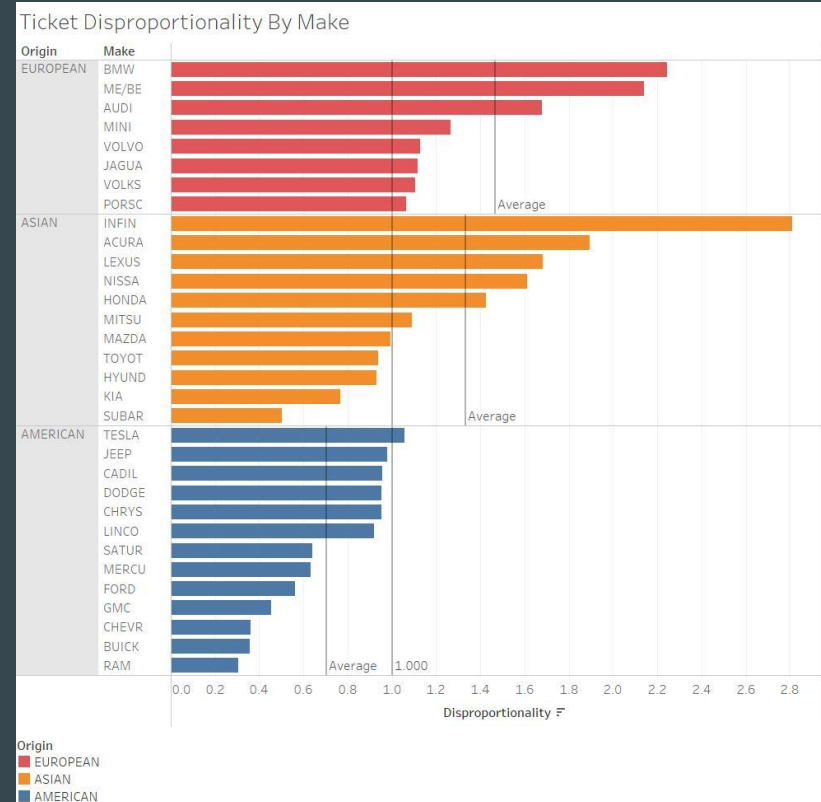


Analysis: Most Common Violations



Analysis: Violations by Vehicle Make

- Hypothesis testing with t-test
 - H_0 = No difference between foreign and domestic
 - P-value = 0.0004 (reject)



Analysis: Violations by Borough

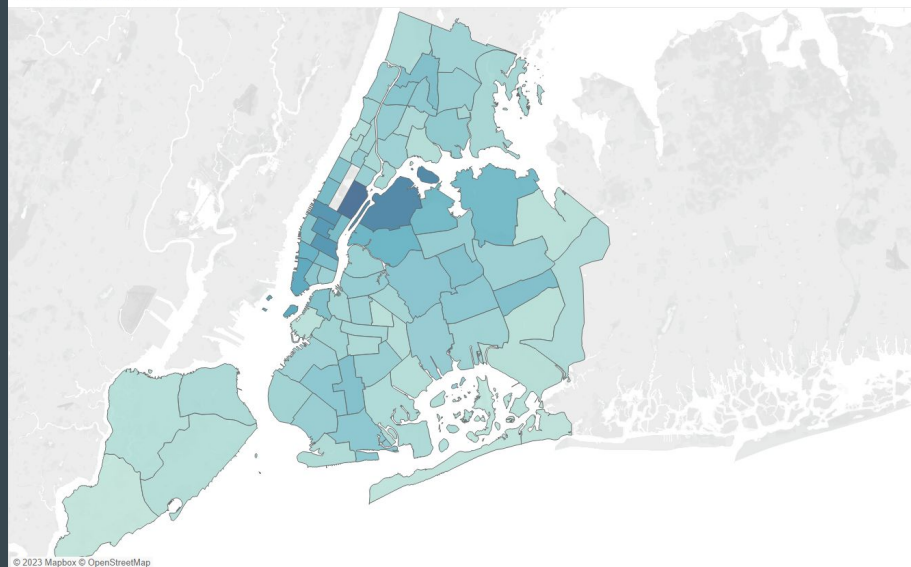
- Per capita by borough, raw figures by police precinct

Violations Per Capita



Violation Ratio
1.0330 1.9826

Violations By Precinct



of Violations
15,351 450,531

Analysis: Most Common Violations

- Vehicles registered in state of NY
 - Most common violations
 - Code 36 (exceeding posted speed limit in school zone)
 - Code 21 (street cleaning parking violation)
 - Code 38 (failing to show receipt or tag in windshield)
- Vehicles registered outside state of NY
 - Most common violations
 - Code 36 (exceeding posted speed limit in school zone)
 - Code 5 (failure to make right turn from bus lane)
 - Code 7 (vehicles photographed going through red light at intersection)

Summary of Knowledge Gained

- Foreign vehicles may be more likely to be ticketed than domestic vehicles
- Per capita, Manhattan issues the most violations. Particularly the Upper East Side
- Parking violation code 36 is the most common violation code and accounts for a majority of violations for both vehicles registered within and out of New York
- Suburbans were the most ticketed vehicle type in 2022

Application of Knowledge

- Do further research into potential bias in ticket enforcement
- Standardize enforcement across precincts
- Focusing on reducing violations of code 36
 - More high visibility signs
 - Increased awareness
 - More research needed to be done on efficacy and cost-effectiveness of potential solutions