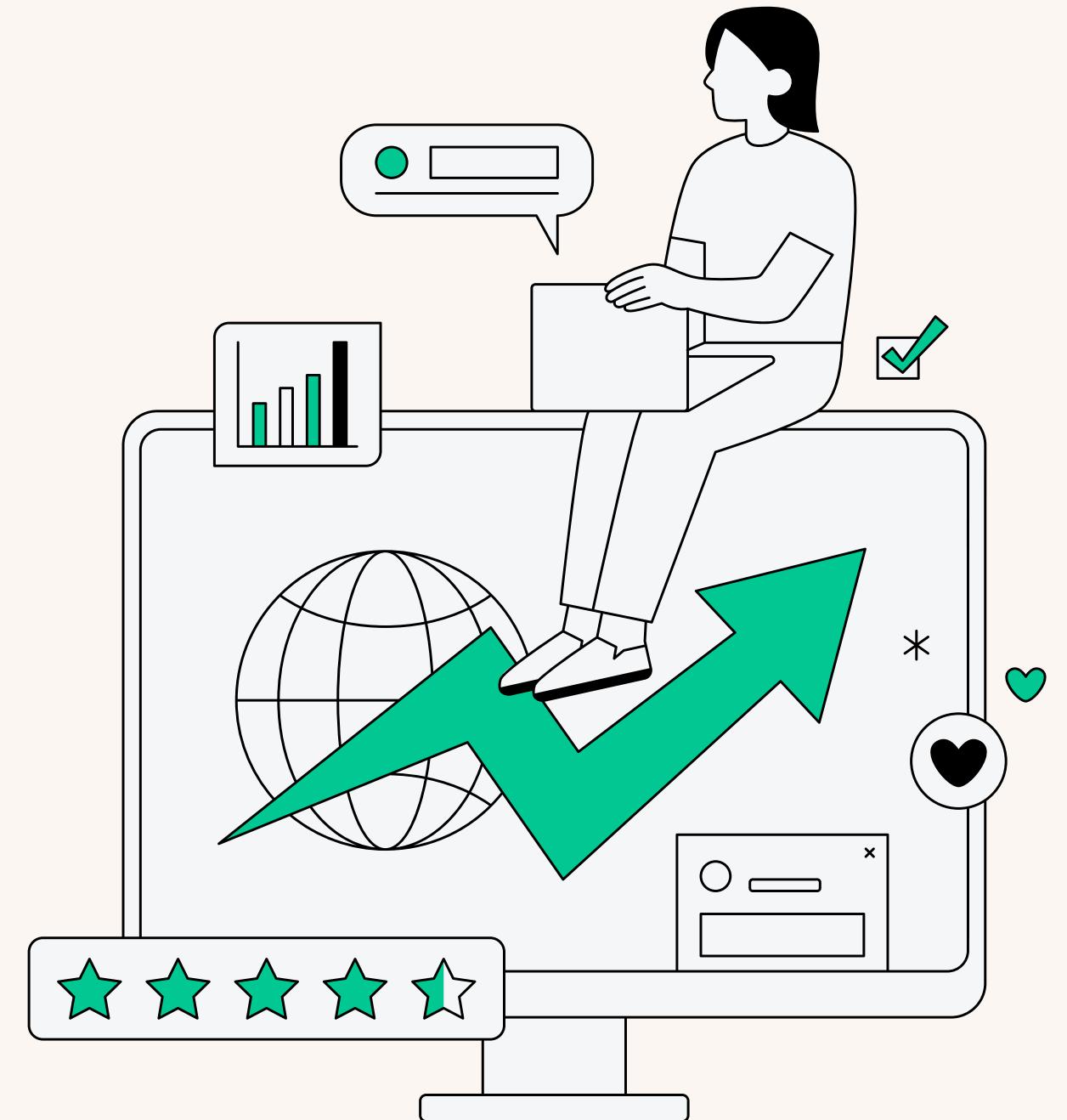


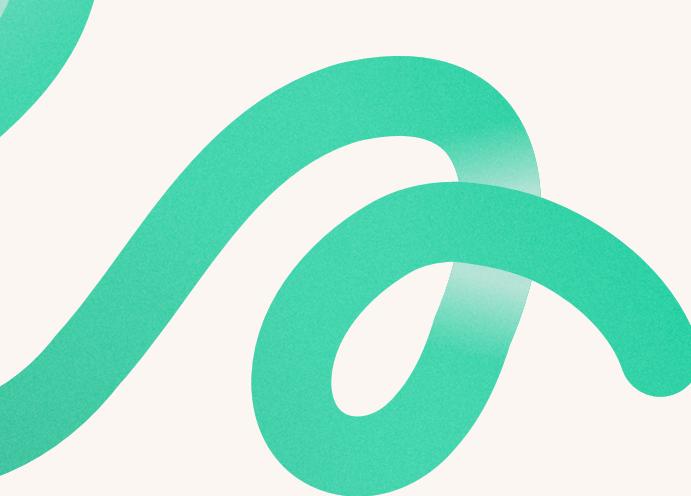
Presented by Tilova Shahrin

# Advanced Modeling

## Scores and challenges

[www.github.com/tilovashahrin](https://www.github.com/tilovashahrin)





# Data Overview

## Parking Ticket Data 2016-2022

1. Date and time of Infraction.
2. Specific time of infraction.
3. Code for the violation.
4. Description of the violation.
5. Fine amount set.
6. Latitude coordinate of the location.
7. Longitude coordinate of the location.

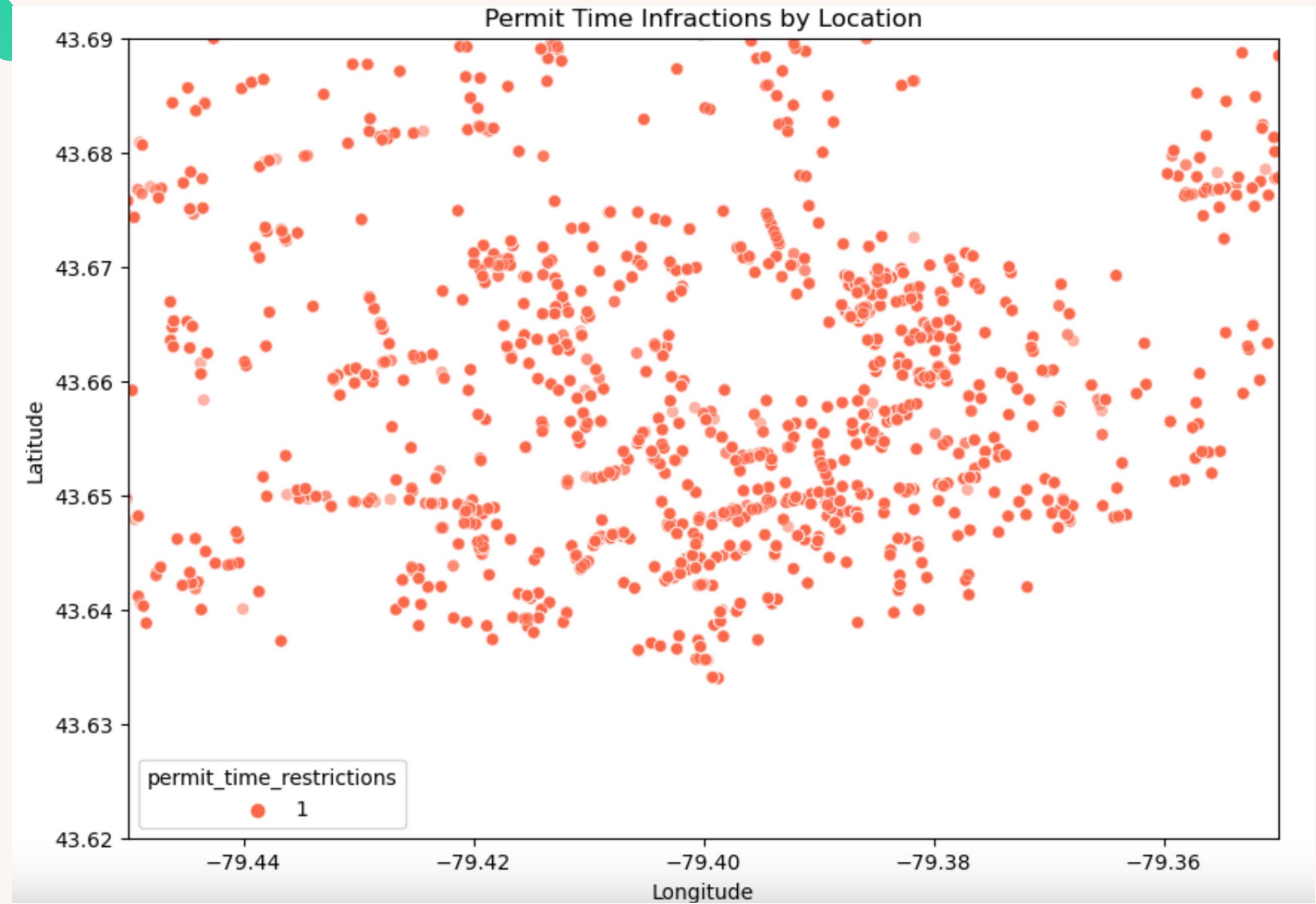
12.9 Million Rows

1.7 Million Coordinates

# Predicting Infractions using Latitude and Longitude

01. Decision Tree
02. Random Forest
03. Multi-Output Classifier
04. Grid Search





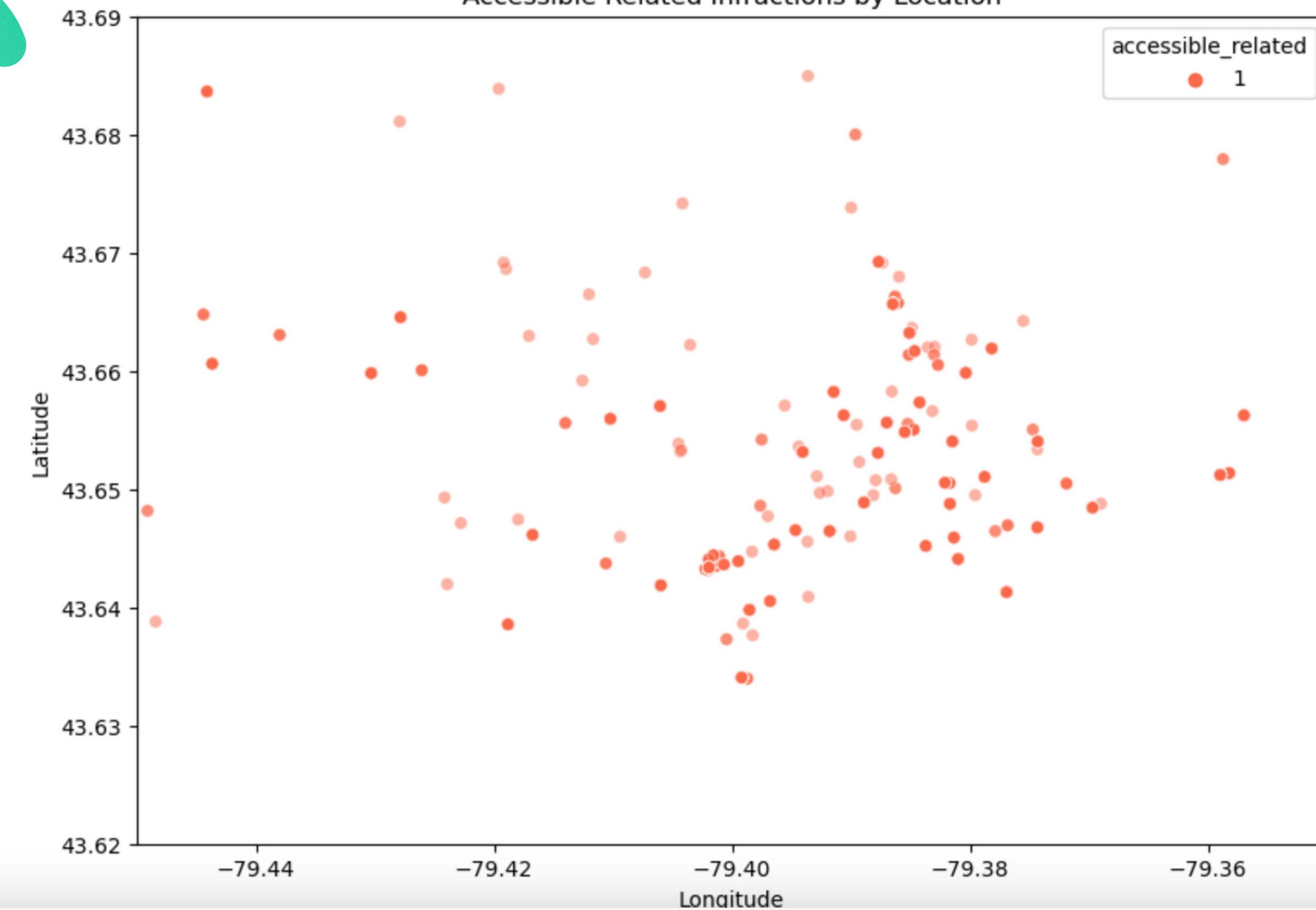
# Decision Tree

- Types
  - Permit Time
  - Fee not paid
  - Time related
  - Fire Route
  - Accessible spots
  - Commercial
  - Obstruction
  - Cycle

Classification report - Permit time

	F1 Score	Support
0	0.85	281207
1	0.82	235392
Accuracy	0.84	

### Accessible Related Infractions by Location



## Classification report - Accessible Related

	F1 Score	Support
0	1.0	510468
1	0.58	6131
Recall	0.53	



# Random Forest Classifier

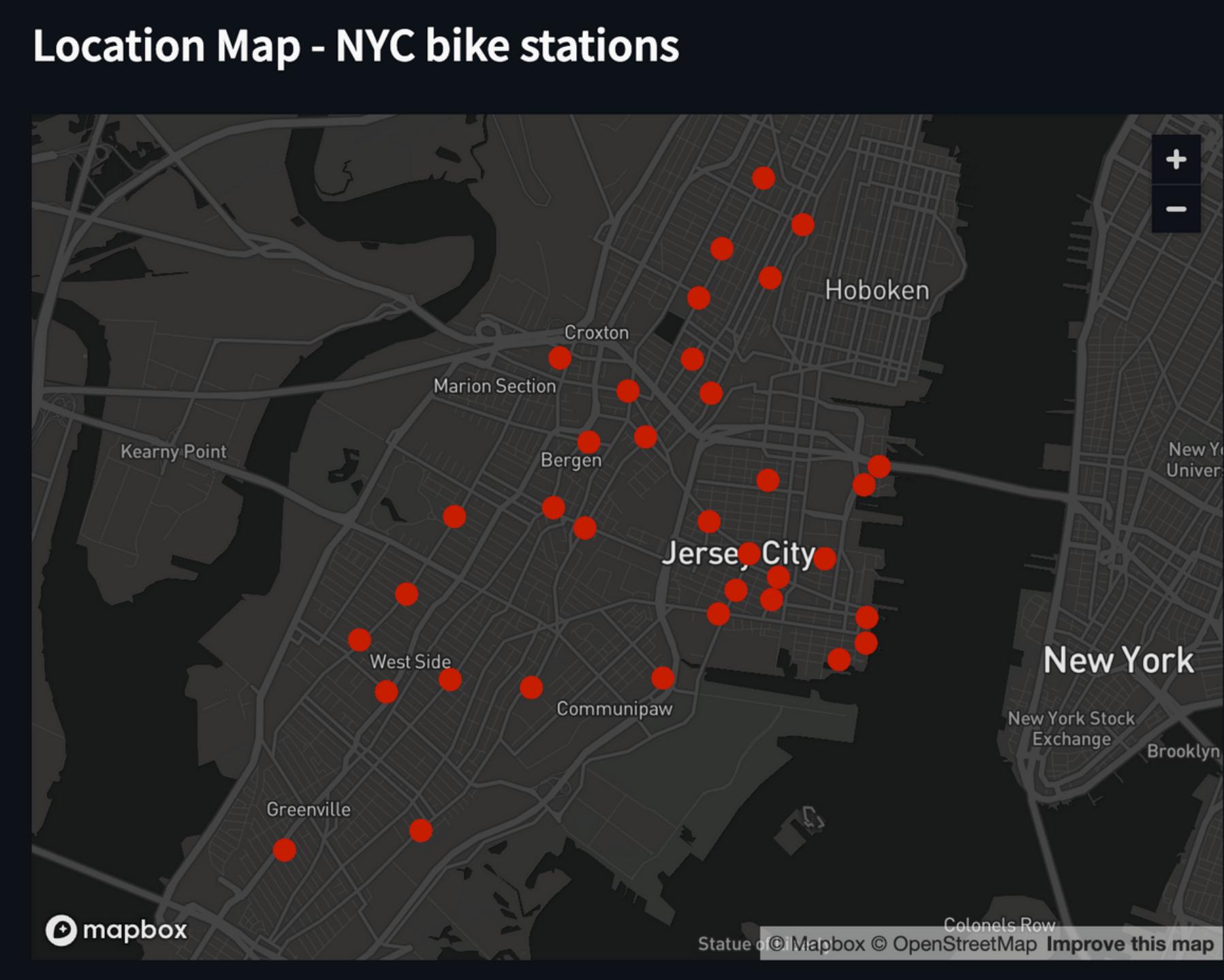
## 'Balanced' Weight Class

	precision	recall	f1-score	support
0	0.60	0.86	0.71	122482
1	0.51	0.84	0.64	113104
2	0.51	0.89	0.65	58050
3	0.10	0.86	0.17	11359
4	0.20	0.97	0.33	6131
5	0.25	0.98	0.39	8367
6	0.03	0.77	0.07	4441
7	0.04	0.97	0.08	1436
micro avg	0.37	0.86	0.52	325370
macro avg	0.28	0.89	0.38	325370
weighted avg	0.51	0.86	0.63	325370
samples avg	0.32	0.45	0.36	325370

## Custom Weight Class

	precision	recall	f1-score	support
0	0.77	0.63	0.69	122482
1	0.69	0.58	0.63	113104
2	0.77	0.67	0.72	58050
3	0.73	0.15	0.25	11359
4	0.65	0.53	0.58	6131
5	0.69	0.47	0.56	8367
6	0.74	0.03	0.06	4441
7	0.62	0.07	0.12	1436
micro avg	0.73	0.59	0.65	325370
macro avg	0.71	0.39	0.45	325370
weighted avg	0.73	0.59	0.64	325370
samples avg	0.30	0.30	0.30	325370

# Product Demo



Enter Your Address Here

4700 Keele St

We predict that you will likely be issued a permit time parking offence and will be fined \$30

Presented by Tilova Shahrin

# Thank you very much!

