

Electrical Vehicle Analysis

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Objectives

Motivation

- Wide spread of electric vehicles in USA
- Environment impact
- Technology innovation

Our aim

- Analyze the distribution of the registered electric vehicles in USA
- Design a business plan for Auto repair company in Washington city





01

Data cleaning and inspection





Dataset : Electric Vehicle Population Data (data.wa.gov)

Key Columns:

Electric Vehicle Type:

- Pure electric or plug-in hybrid.

Make & Model:

- Manufacturer & Model of car

Electric Range:

- Traveling distance purely using electricity

Location:

- Location of registered electric vehicles

	count	unique	top	freq
VIN (1-10)	210165	12377	7SAYGDEE6P	1215
County	210165	203	King	107115
City	210165	758	Seattle	33854
State	210165	47	WA	209720
Make	210165	43	TESLA	91379
Model	210165	153	MODEL Y	44038
Electric Vehicle Type	210165	2	BEV	165554
Clean Alternative Fuel Vehicle (CAFV) Eligibility	210165	3	Unkown	118654
Legislative District	210165	50	41	13196
Vehicle Location	210165	931	POINT (-122.13158 47.67858)	5256
Electric Utility	210165	74	PUGET SOUND ENERGY INC CITY OF TACOMA - (WA)	76606



Data cleaning

	NaN
VIN (1-10)	0
County	4
City	4
State	0
Postal Code	4
Model Year	0
Make	0
Model	0
Electric Vehicle Type	0
Clean Alternative Fuel Vehicle (CAFV) Eligibility	0
Electric Range	5
Base MSRP	5
Legislative District	445
DOL Vehicle ID	0
Vehicle Location	10
Electric Utility	4
2020 Census Tract	4

- Ensure that all field are valid through changing the NaN fields into string “nan”
- Fill NaN values using forward fill method (ffill)
- Ensure consistent formatting across each column



02

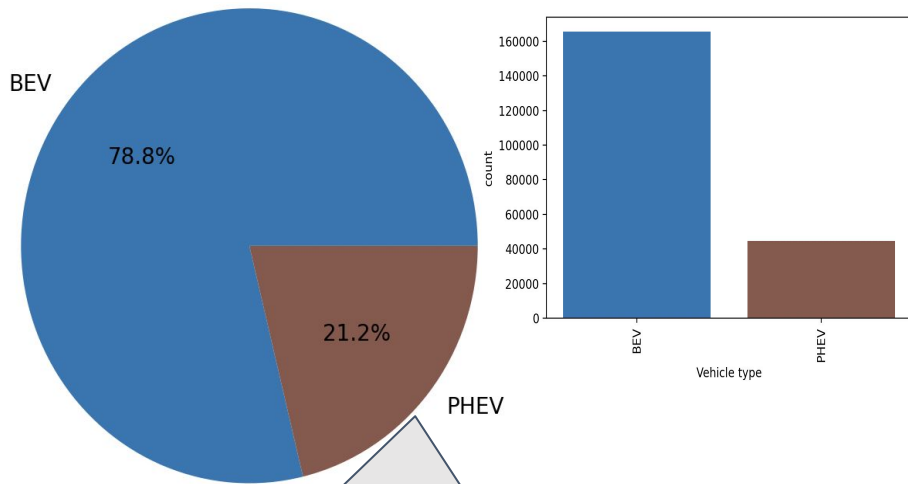
EV Distribution Analysis over USA



Counting of EV over USA

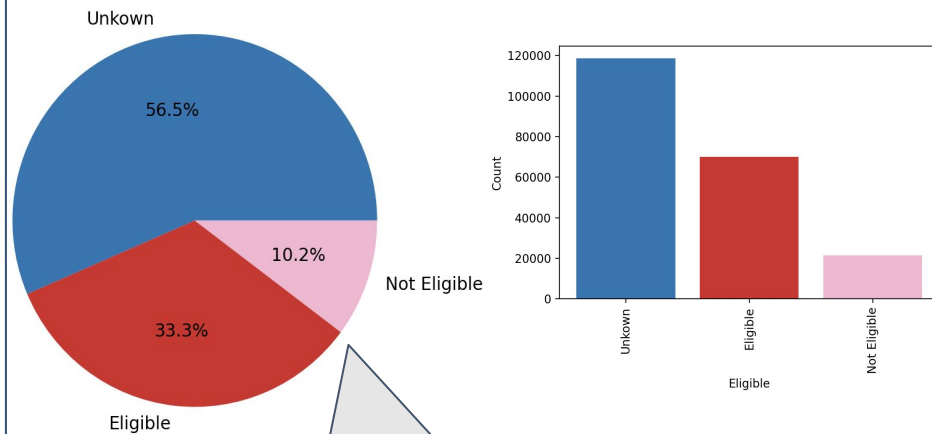


Count by the electric type



Battery Electric Vehicles(BEV) are more popular than Plug-in Hybrid Electric Vehicles(PHEV)

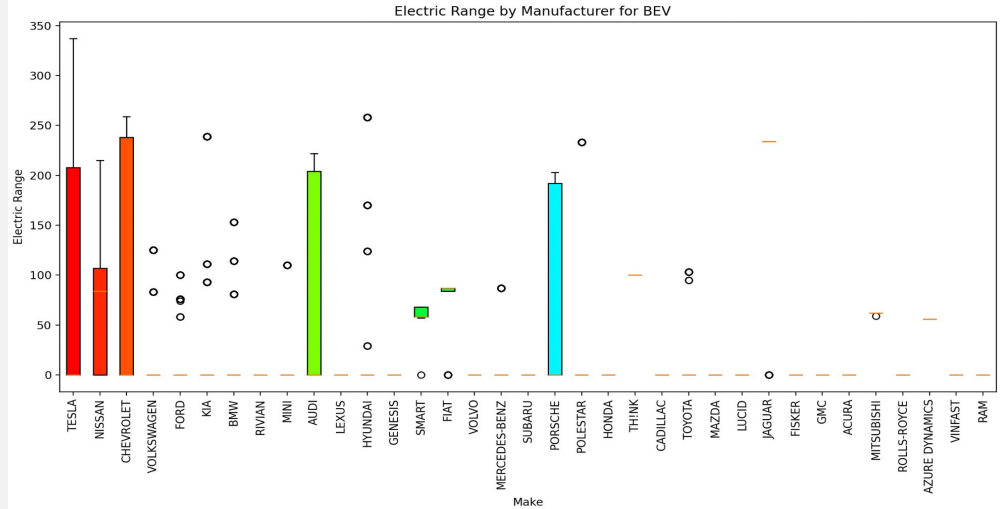
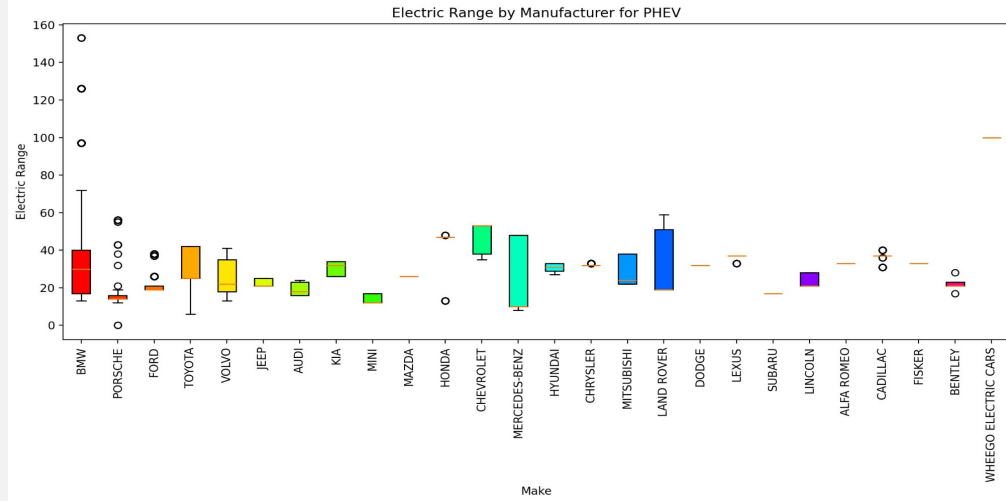
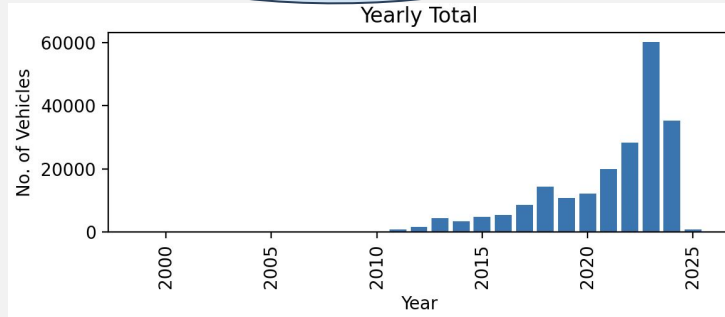
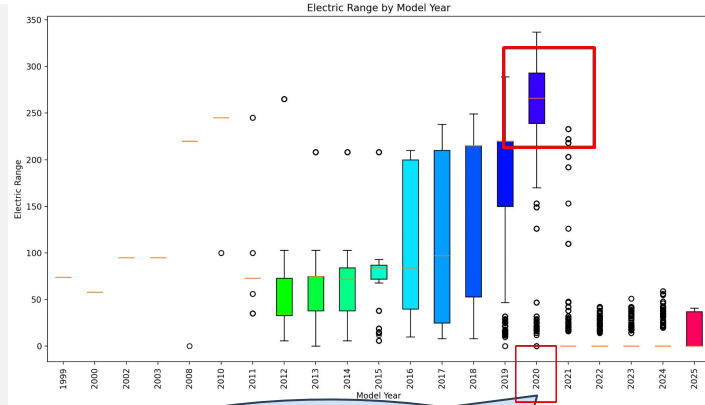
Count of CAFV



34 % of the vehicles are eligible for alternative fuel, while 10 % are not.

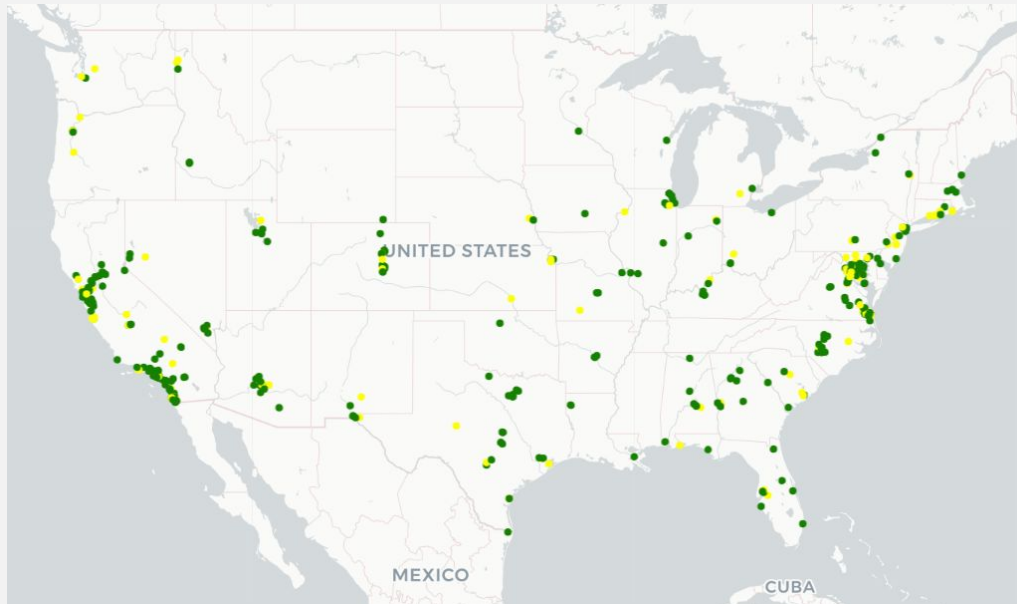


Electrical range

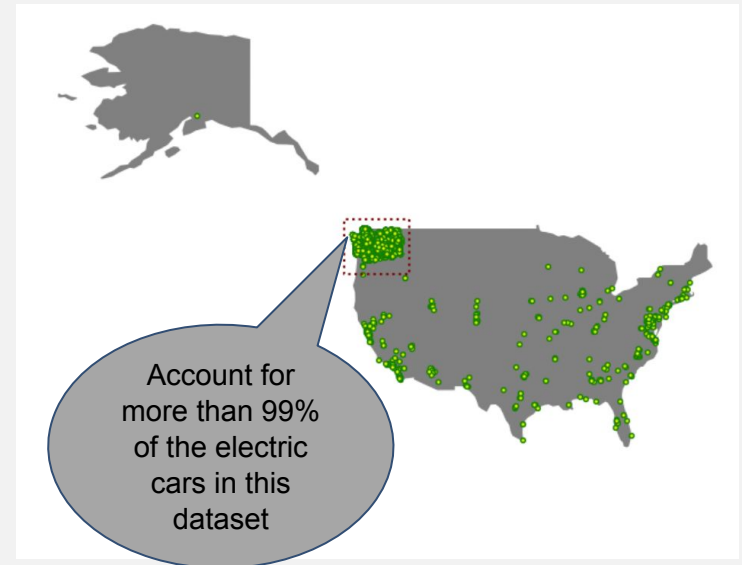


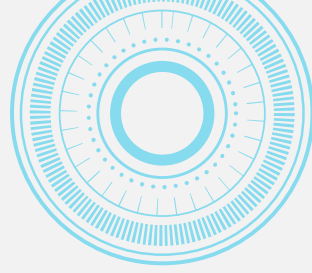
BEV and PHEV distribution over USA

BEV and PHEV distribution over USA



Presence of electric Vehicles across the USA



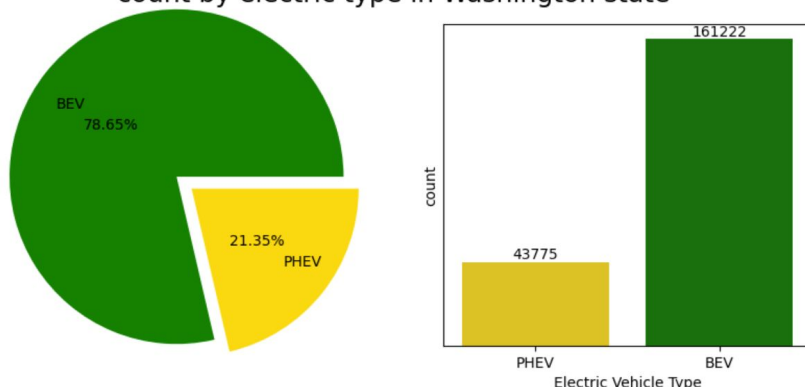


03

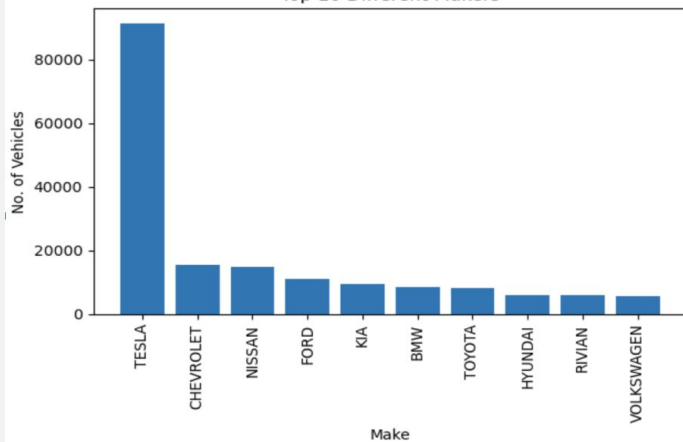
Focus on Washington state

Gross Counts of EV in Washington

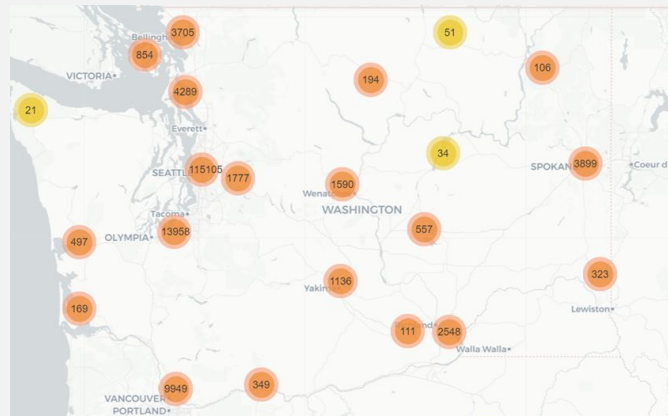
count by electric type in Washington state



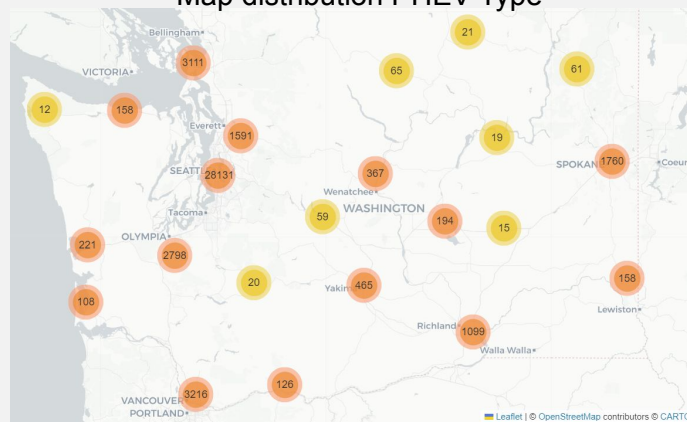
Top 10 Different Makers



Map distribution BEV Type



Map distribution PHEV Type



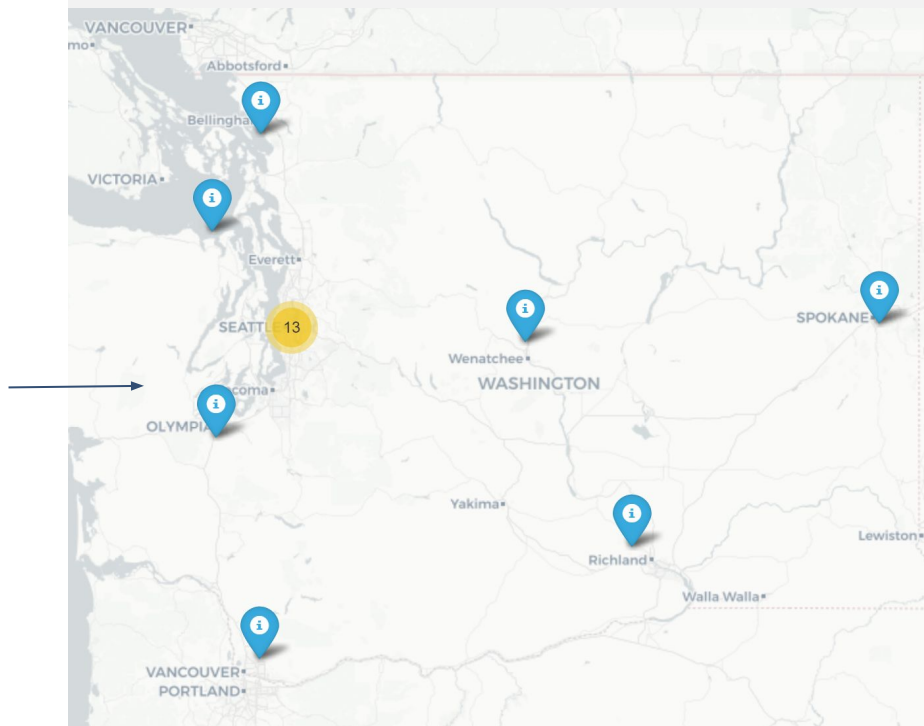
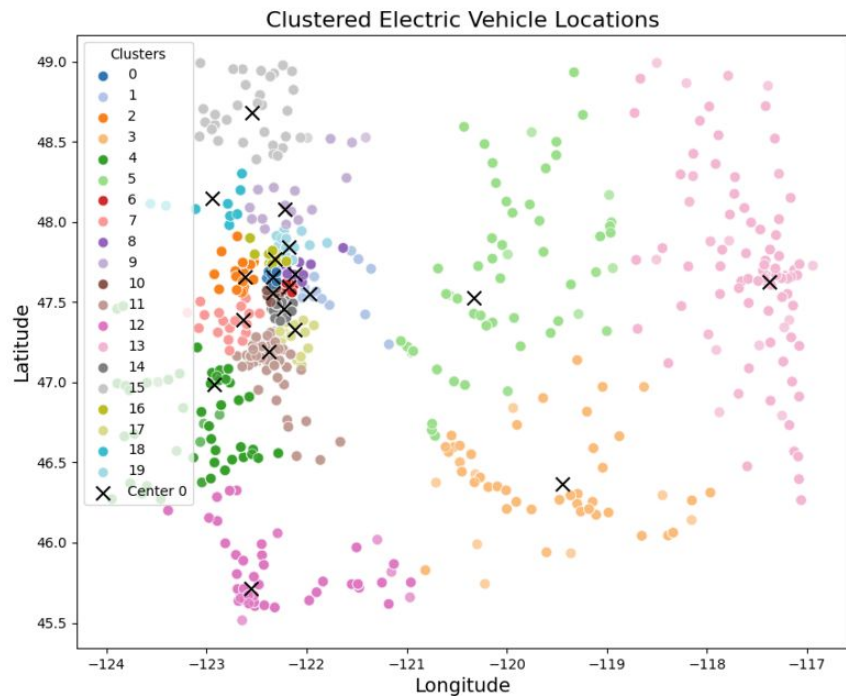


Business planner for an Auto Repair company

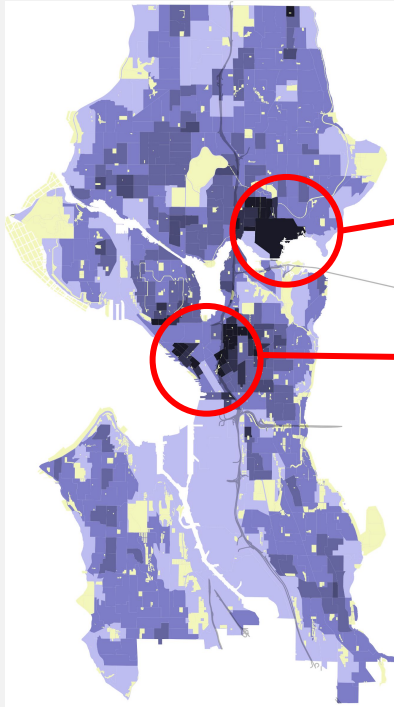




Clustering

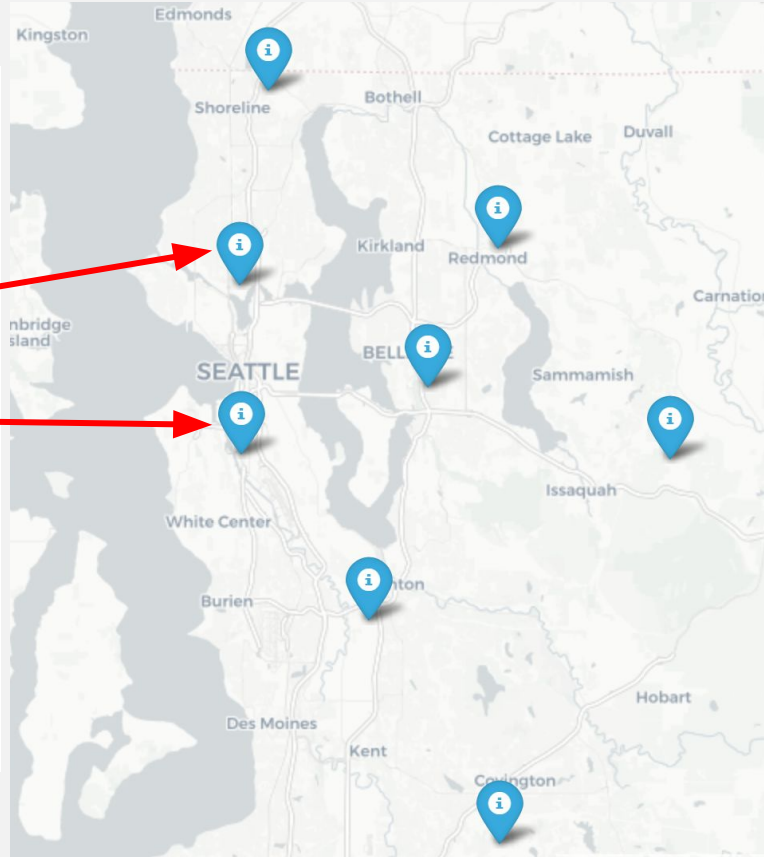


Shattering



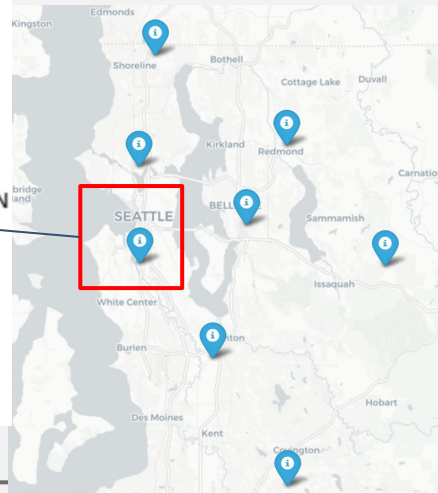
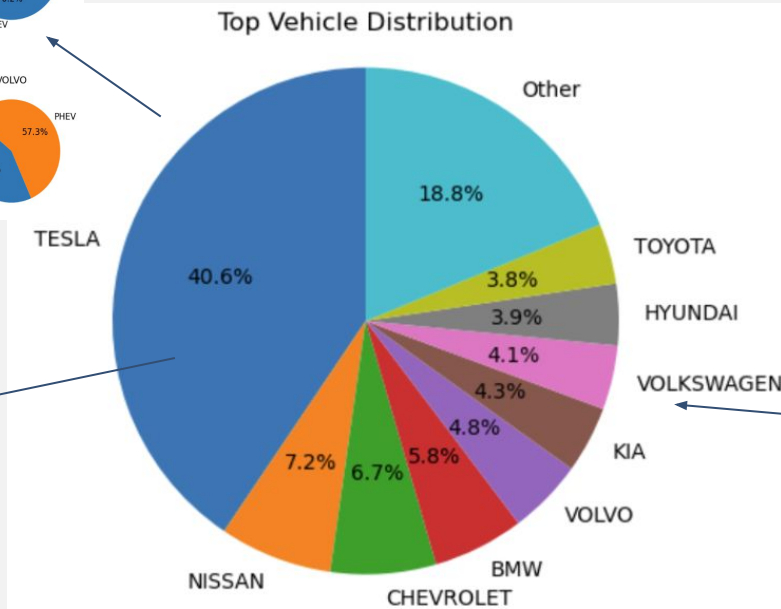
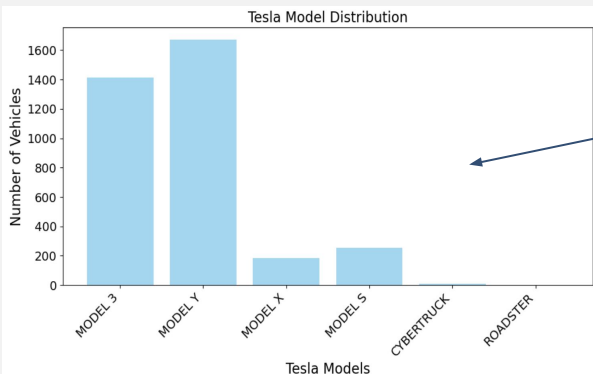
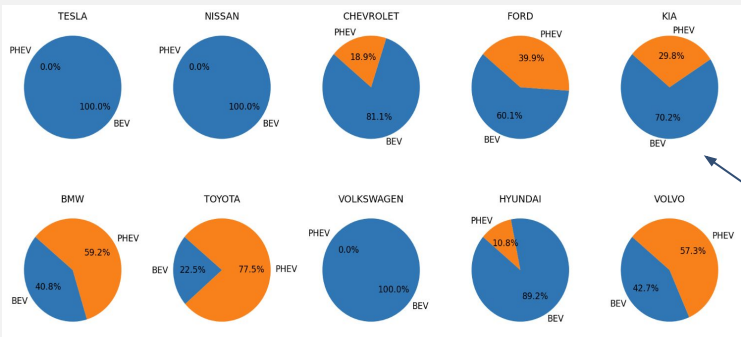
Persons per Square Mile

- 0 - 5000
- 5001 - 10000
- 10001 - 15000
- 15001 - 20000
- 20001 - 25000
- 25000+





Vehicle Distribution around Shop in Downtown Seattle





Thanks!

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