How Demographics and Urbanization Affect EV Adoption in New York

Agenda

- Project Aim and Importance

- Inital Data Sources

- Data Structure

- Exploratory Data Analysis

- Correlation Analysis

- Summary

Project Aim and Importance

- Electric Vehicles are an effective way of reducing carbon emissions

- Adoption of EVs varies wildy

- Project Aim
  - Identify factors influencing EV adoption
  - Correlate demographic characteristics with EV penetration rates in New York counties

- Why New York?
  - Covers a wide range of demographics
  - From rich to poor, from metropolis to village

Initial Data Sources

New York DMV: Vehicle registration data
- Open data, no attribution needed
- Up to date

Census Bureau: Demographic data
- Open data, attribution required
- Frozen in 2022, updated every 3 years

Data Structure

| Column	Interpretation
County	County of New York
EV_Percent	Percentage of Electric Vehicle Registrations
Rural_Percent	Percentage of households classified as rural by the Census Bureau
Average_Education_Level	A continuous variable ranging from 1 (less than 9th grade) to 7 (graduate or professional degree)
Median_Age	Median age of the population of the county
Females per 100 Males	Gender ratio
Races (White/Black/Asian...) %	Do not add up to 1. Only include the most relevant ones.
Median Household Income	Amount of money that the median household in the given area makes.

EV Distribution

- Concentration of Electric Vehicles
  - Predominantly in and around New York City
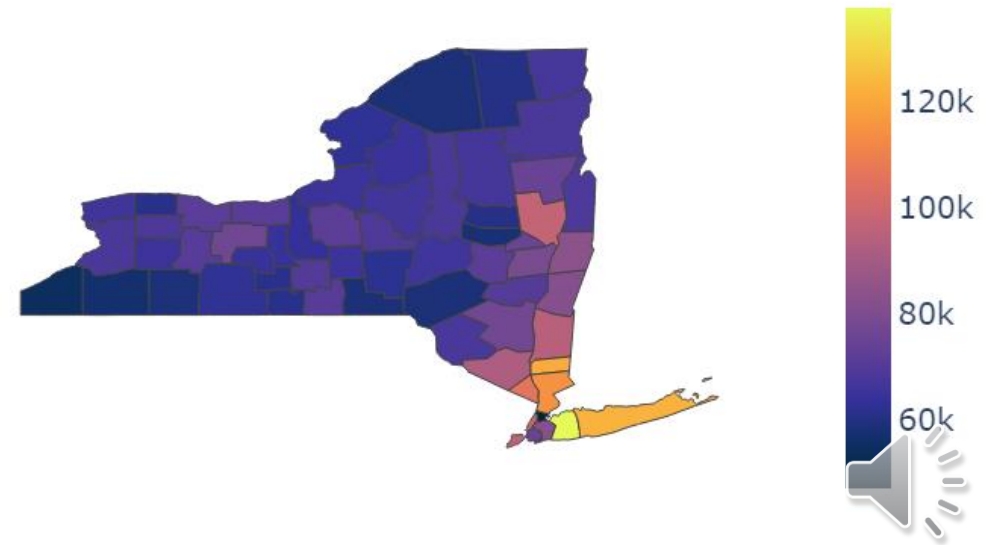 - Higher concentrations in other major metropolitan areas
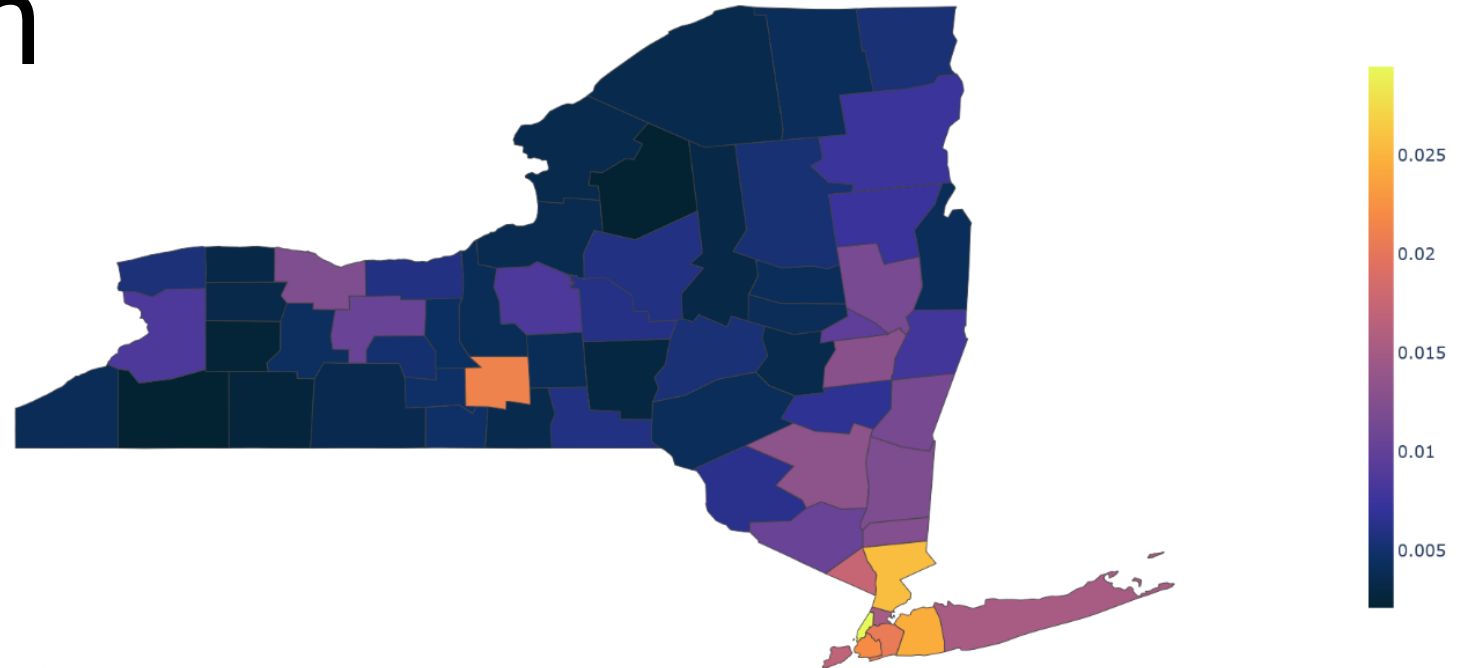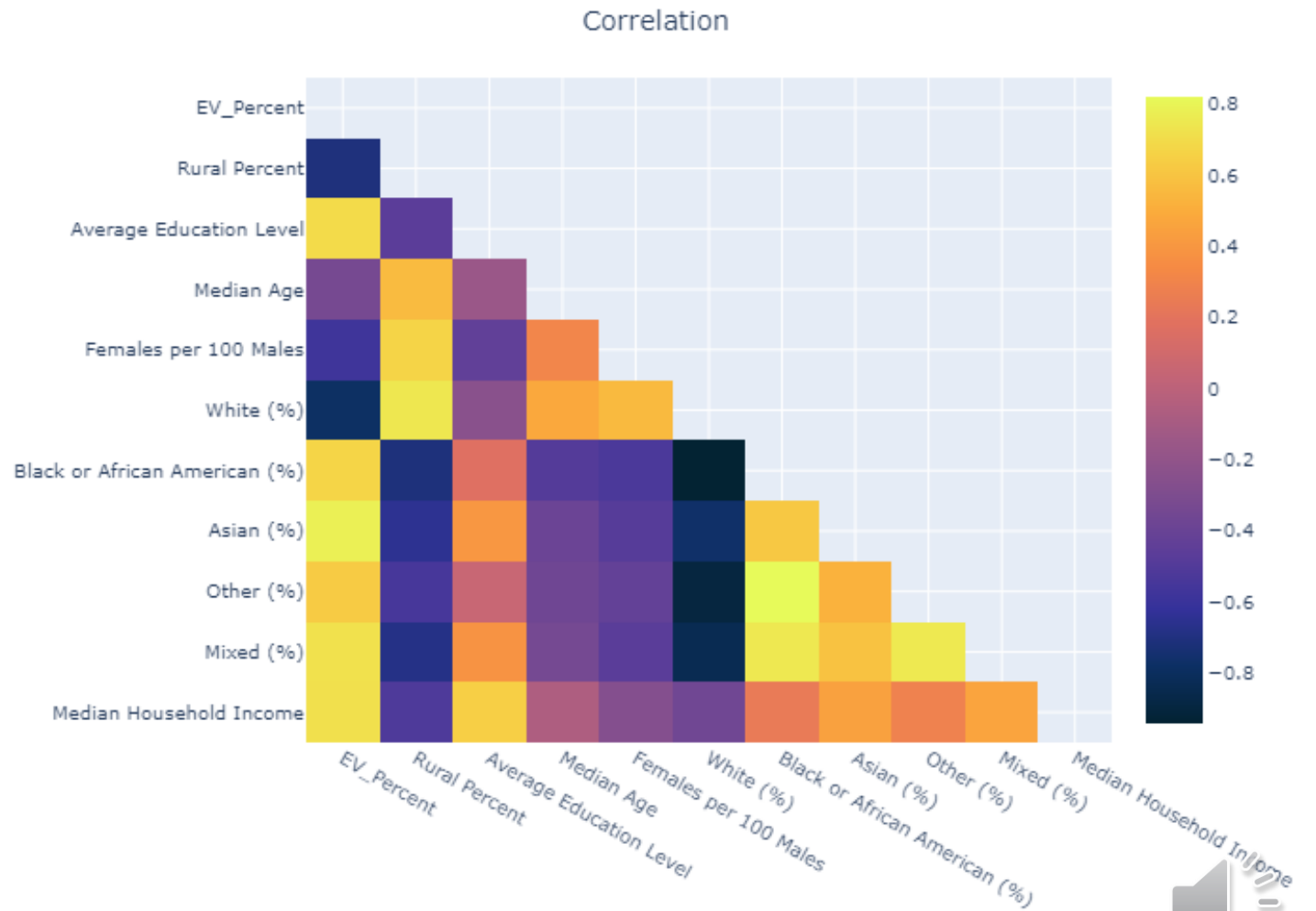
Demographic Observations

Rural Percent
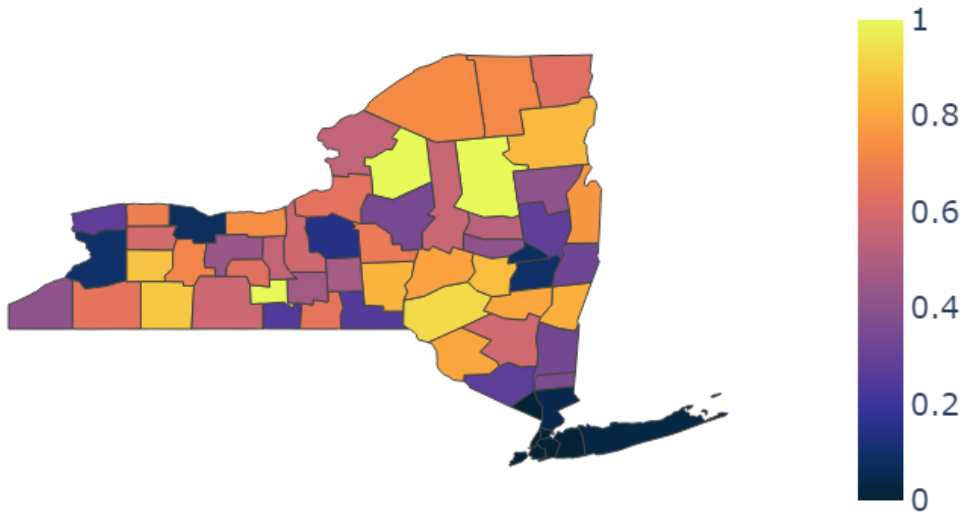
Median Household Income

Correlation Analysis

- Percentage of EV is strongly correlated with all other metrics

- Lots of correlations between the other metrics as well

Correlation

Summary of Findings

- EVs are still the choice of wealthier, highly educated people in densely populated areas

- How can we change this:
  - EVs need to become cheaper and need to develop a healthy second-hand market
  - The range concern in rural areas can be addressed by better charging infrastructure and by advances in battery technology
  - Lastly, a change in the perception of EVs is needed. This will happen naturally as adoption rises, but could be supported by information campaigns