Cohabitational Housing for Single Mothers

Data Analysis for CoAbode.org

CoAbode
Single Mothers House Sharing

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Agenda

- Business Case
- Data
  - Initial findings
  - Model findings
- Recommendations
- Next Steps

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Single Mothers head
Single Parent Families

79.5%

24.3% of families were
Food Insecure

40% of annual
income spent
on child-care

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Overview

- **Our client: <u>CoAbode.org</u>**
  - Cohabiting social networking service
  - matches single mothers interested in living together

- **CoAbode's Business Goal**:
  - one-stop-shop for a housemate and a house
  - Recommend best value home and school district, based on budget

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Business Understanding

CoAbode's clients are <u>single mothers.</u>

Client Preferences:

- Minimum 4+ bedrooms (2 single mothers and their children)
- Quiet neighborhood
- Good school district
- Affordable price to split

Defining a "Family Home" as meeting the above criteria

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Data Understanding

Building a model to predict prices for houses of interest to single mothers.

Using the following datasets:

- King County, Washington House Sales Data
    - Records are houses with info regarding its dimensions, location, and condition

- 2021-2022 Report Card Assessment Data for Washington State
    - Test scores by student demographic for each school in the state

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Exploratory Data Analysis

Distribution of House Sale Prices in King County, WA
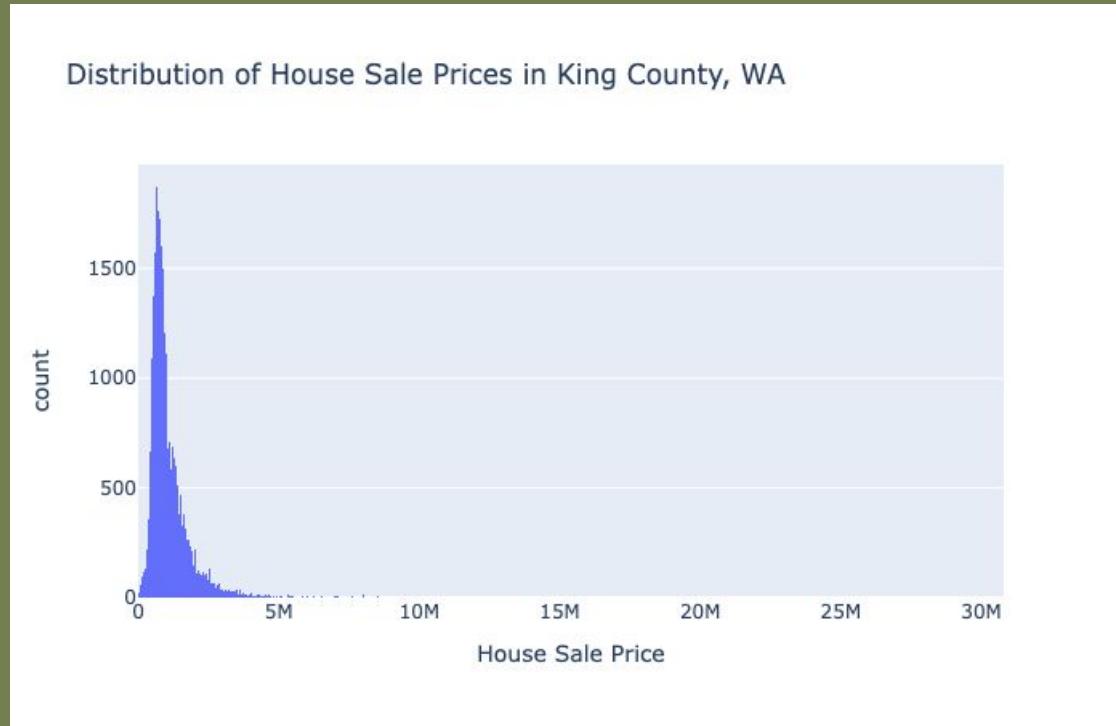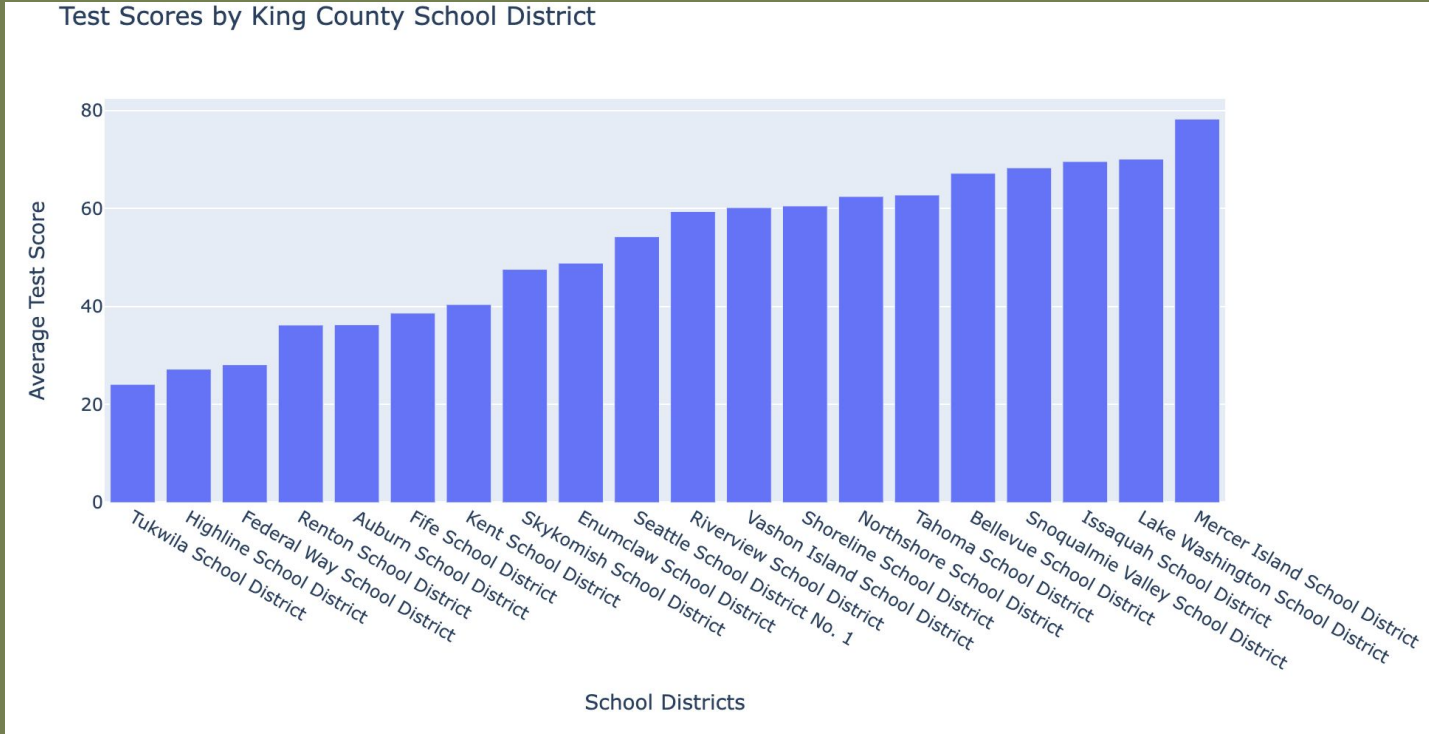
Positive skew in overall price data

Exploratory Data Analysis

As expected there is a positive correlation between the size of a home (square foot living area) and it's price

Relationship between Living Area Sqaure Footage and House Sale Prices

Exploratory Data Analysis

Test Scores by King County School District
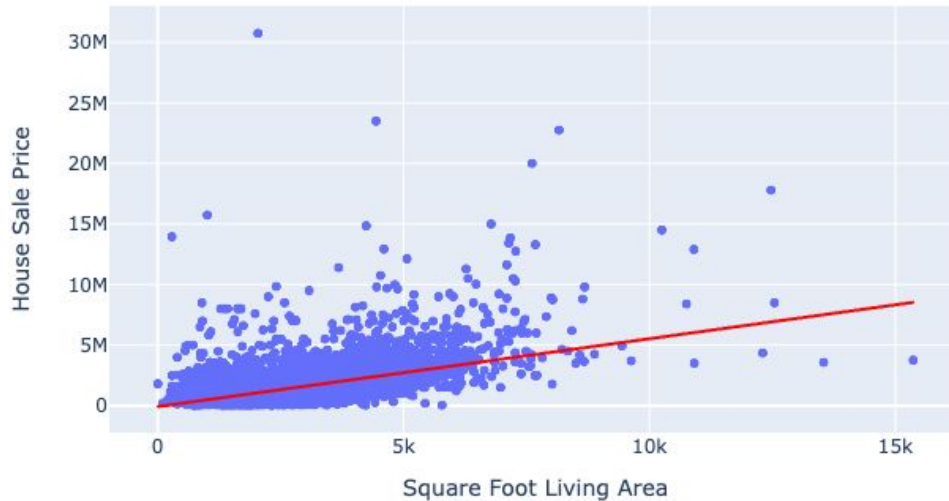
Modeling

Baseline Model:

The larger a home, the higher the price.

Ran a multi-linear regression model based on solely **continuous features** that had numerical data.

Final Model:

Price is affected by categorical factors just as much as size.

Ran a multi-linear regression model on including considerations:

- Location (waterfront, parks, zip code, etc)
- Neighborhood noise
- Heating power source
- Number of bathrooms

Regression Results

How much of the variance in price were we able to explain?

Baseline Model:

51.2 %

Error: About $353,000

(A little too much room for error...)
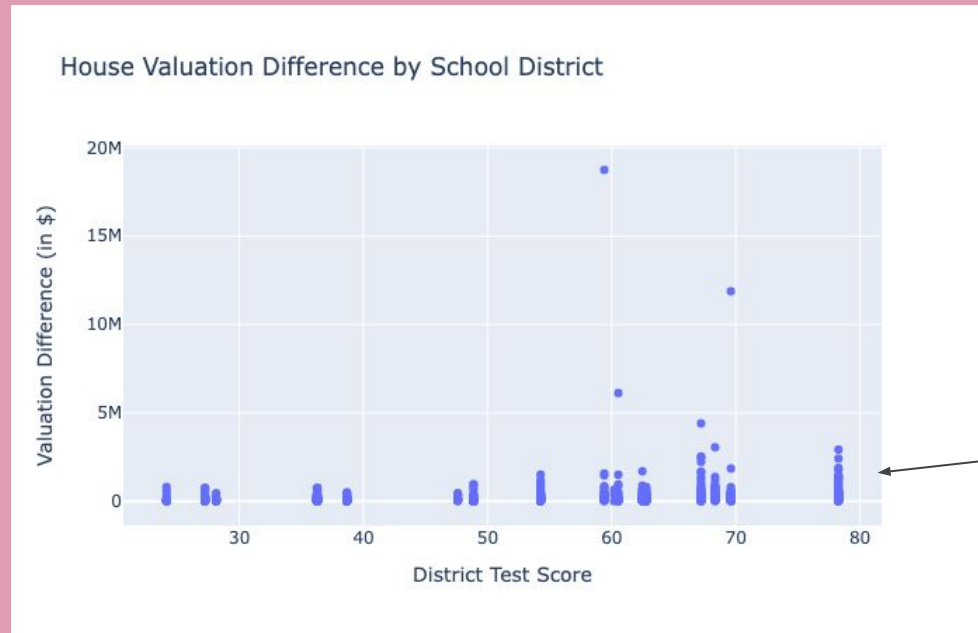
Final Model:

70.5 %

Error: About $226,000

(Much better!)

Recommendations

- Mercer Island area
  - a considerable number of undervalued family houses (4th highest)
  - the best test scores in the county

House Valuation Difference by School District

Mercer Island School District

Next Steps

- Next, we would look at rental data for these areas as it is likely that not all of these single mothers are looking at buying a home together and may prefer renting.

- We hope that we can use this model to help find the best family home within a given budget for cohabiting single mothers in other parts of the country.

- Finally, as CoAbode is looking to expand, we would like to look into community housing for artists, queer youth, single fathers, etc.

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Thank You

Questions?

Aidan O'Keefe & Ashley Heinke

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