

Housing in King County (USA)

EDA project
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Preliminary hypotheses

1. Price per square foot depends on the house conditions



2. Price per square foot depends on the ZIP code



3. Renovated house sells at a higher price

Erin Robinson

Heiress

Philanthrope

Wishes to improve society by investing in low-income areas and doesn't expect much in return

Mother of two children

Request: "Invest in poor neighborhood, buying & selling, costs back + little profit, socially responsible."

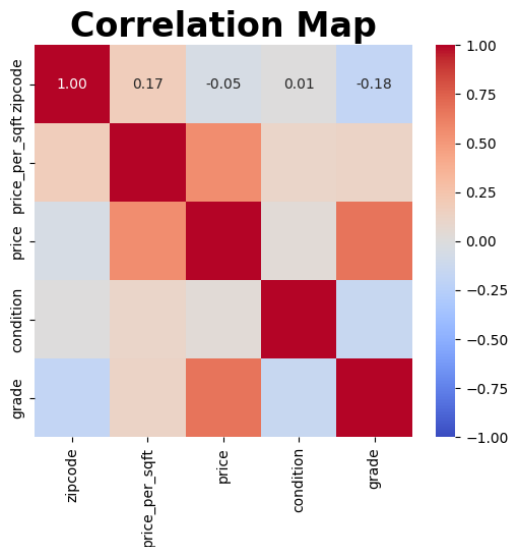
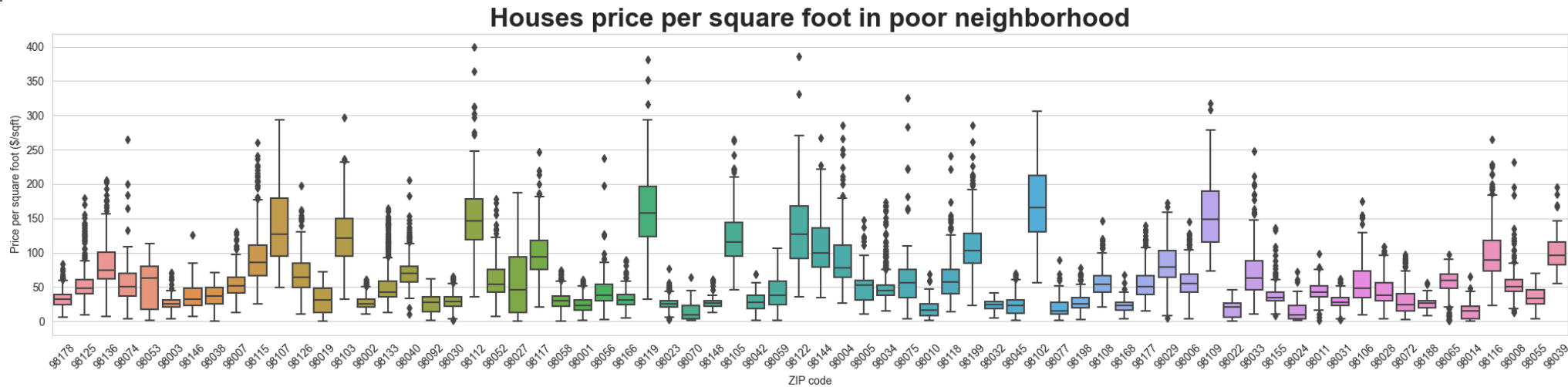
Preliminary Conditions

Client request: “Invest in poor neighbourhood, buying & selling, costs back + little profit, socially responsible”.

Conditions:

- The houses must be in what is considered a poor neighbourhood.
- The house should be modest and cheap.
- Profit: little margin of profit
- Socially responsible: consider the houses in need of renovation

Overview of the house's price per square foot

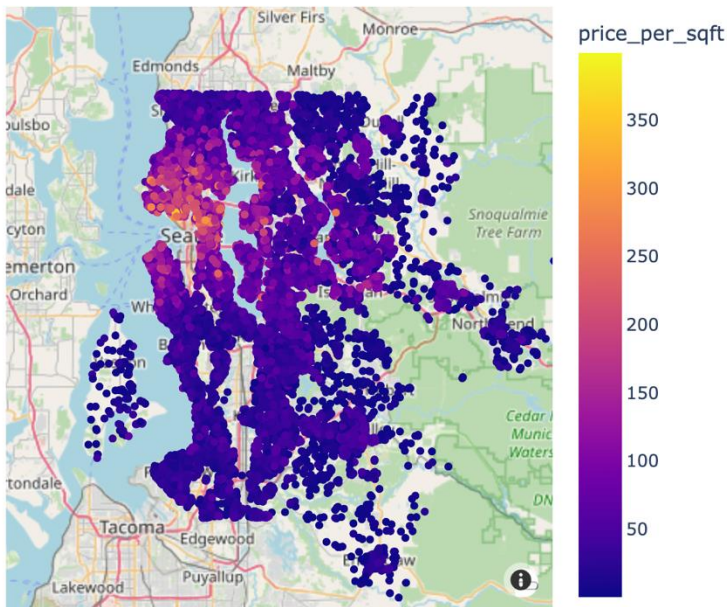


- The boxplot shows a strong variation in the price per square foot in all ZIP codes
 - It suggests the relation between zip code and price per square foot is weak, → confirmed by the heatmap
- The correlation map shows a relation between grade and price per square foot

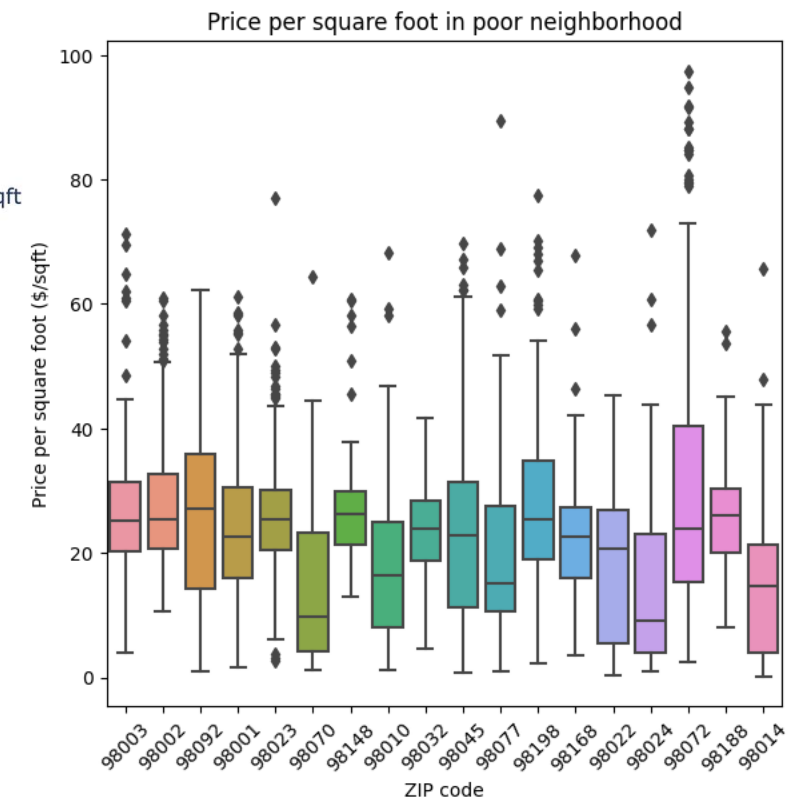
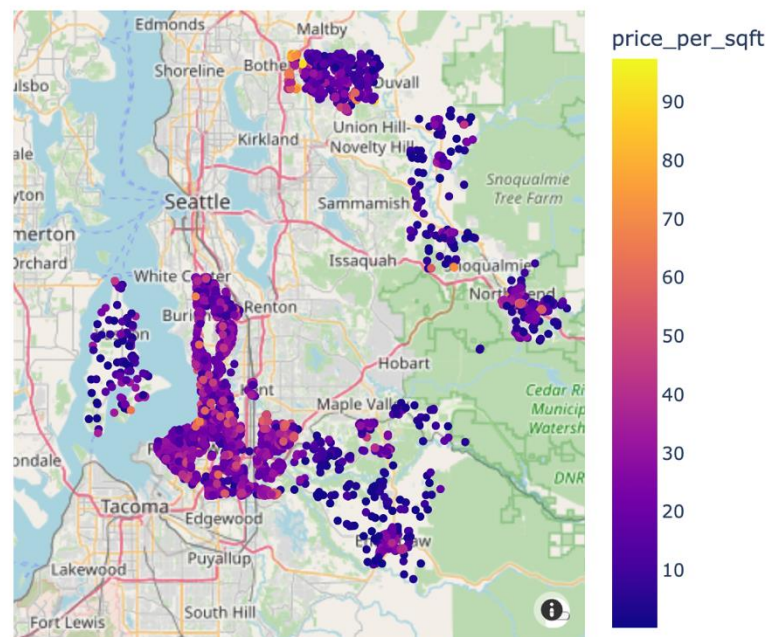
Determination of the poor neighborhood

- The poor neighborhoods were determined by considering the 25% of the median price per square foot grouped by zip code

Houses distribution by Location



Houses in poor neighborhood by Location



House criteria for renovations

Since the client is looking to buy and resell. Cheap house, with low conditions and mid-low grade, must be considered:

The condition should be lower than 3

Grade should be less than 6 (modest house)

It should be cheap: the price should be below 30% of the price range per zip code

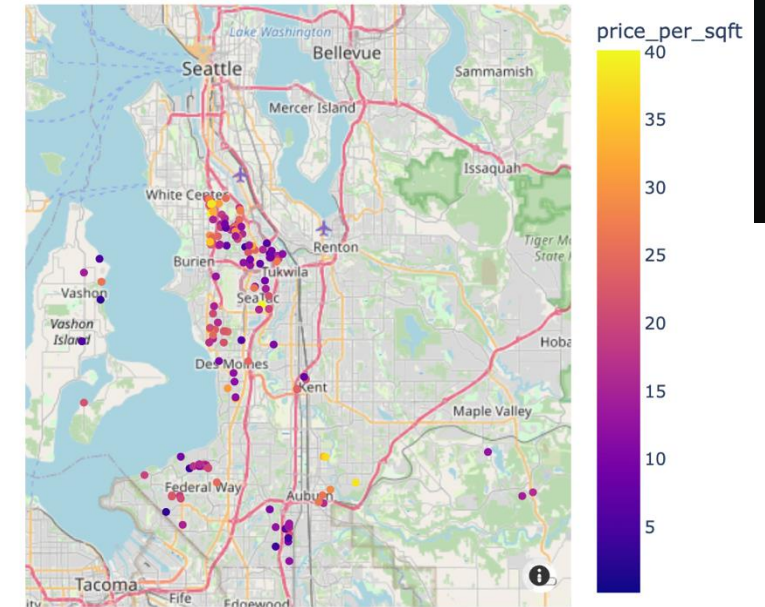
Socially responsible: the house should not have been renovated before

Candidates for renovations

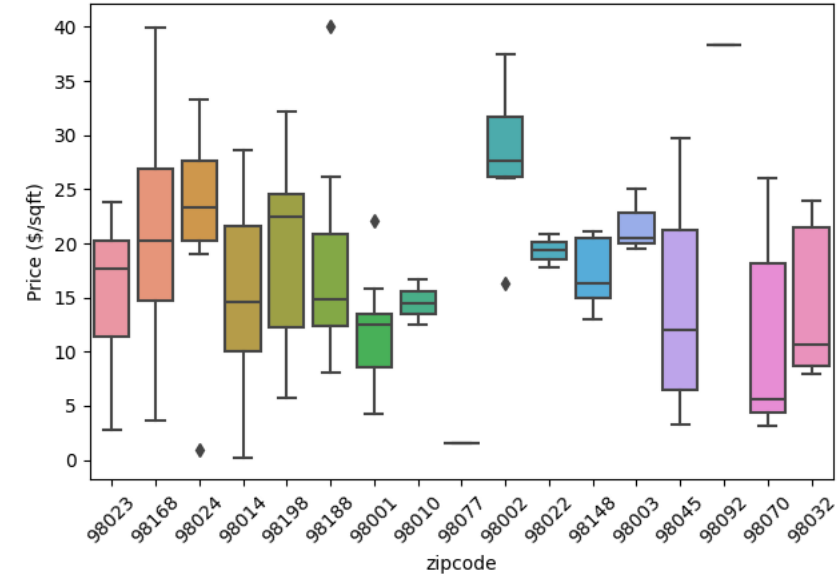
Most of the houses respect the previous criteria have

- a price range between 5 - 40 \$/sqft
- a grade value of 6
- and a condition state of 3

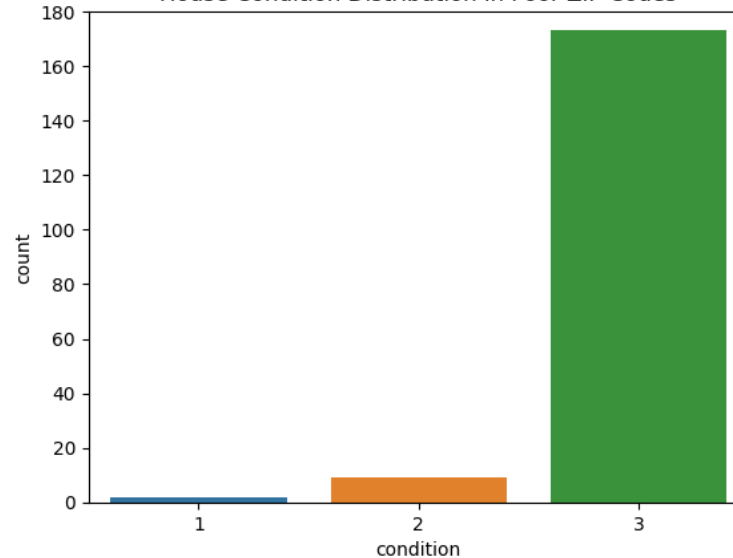
Investment Candidates by Location



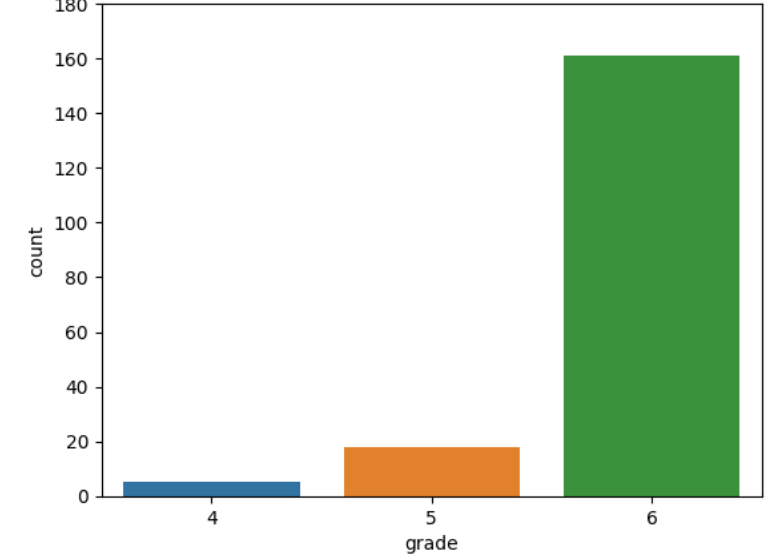
Price per square foot in Poor ZIP Codes



House Condition Distribution in Poor ZIP Codes



House Grade Distribution in Poor ZIP Codes



Renovation cost evaluation

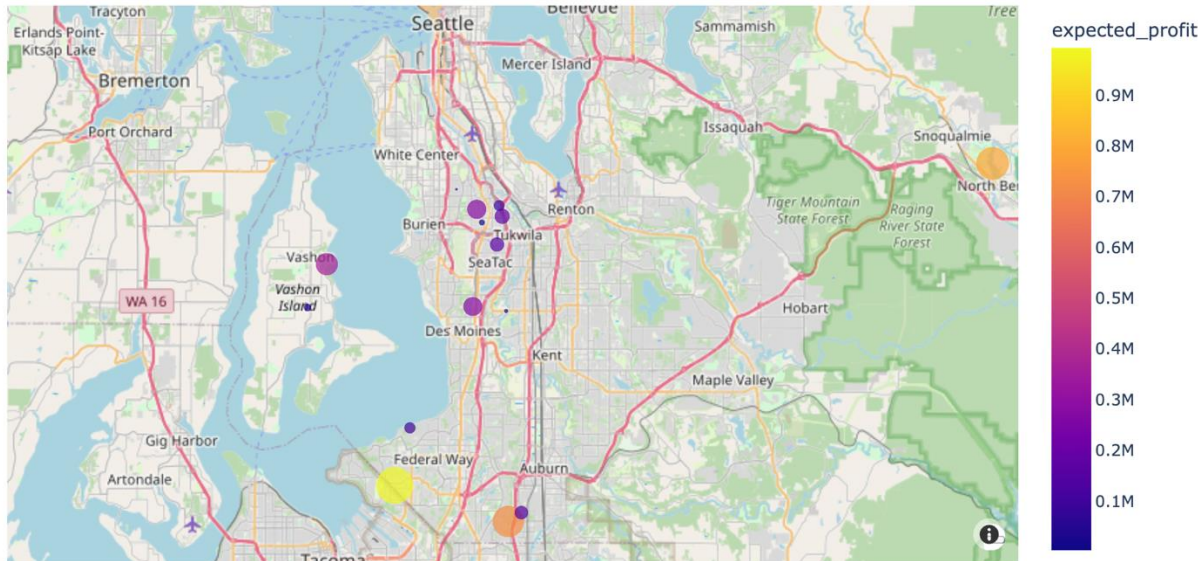
In 2014 the total cost of renovation in King County was between 250\$-350\$ per living square foot

Assuming a mean value of 300\$ per square foot

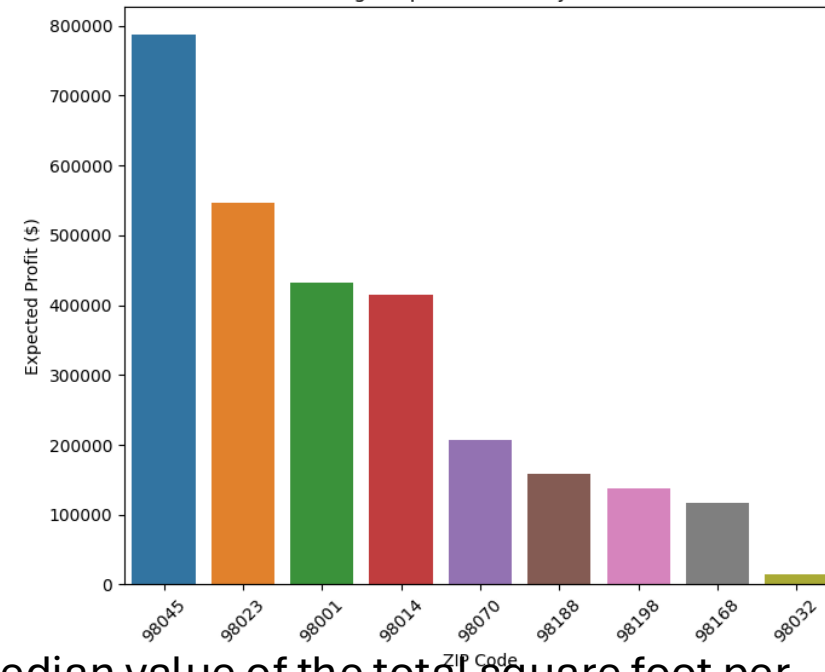
The total cost will be $300\$/\text{sqft}$ times the living square foot (living sqft)

Profits

Investment Candidates by Location



Average Expected Profit by ZIP Code



- Assuming the renovated house will be sold for the median value of the total square foot per ZIP code (resale price)
- The cost of renovation will be 300\$/sqft (renovation cost)
- The expected profit will be:
$$\text{expected profit} = \text{resale price} - \text{price} - \text{renovation_cost}$$

Conclusions

The client should focus on the houses in

- 98188, 98198, 98168, 98032

Which respect the following criteria

- considered poor
- shows a low margin of profit if renovated and sold
- respect the client's desire to be socially responsible, since these houses require renovations

