



# Group 8

## DSF Phase 2 Project

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# Group Members

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# 1 Overview



Multiple linear regression of Northwestern County real estate sales data reveal opportunities for home owners to renovate houses and increase their property values:

- **Upgrade the sizes of the living** and increase number of bedrooms and bathrooms
- **Entire house renovations** are encouraged than partial renovations.
- **Improve overall condition** of the house by regular maintenance.

## 2

## Business Problem

- In the attempt to get to know the impact of the renovations in house values, Finsco Group have provided Hepta group with the sales data to come up with an analysis to support this business proposal.
- Hepta Group will conduct a multiple linear regression model to analyse the house sales in the northwestern county .
- The goal is to get insights to provide advice to homeov investors and clients who do house-flipping.



### 3

## Implications of the Analysis



- Finsco Limited and its clients can strategically invest in real estate by choosing renovations that significantly increase home values.
- Homeowners working with Finsco's consultancy learn which renovations offer the best returns
- House flippers working with FINSCO consultancy can tailor their strategies to target high-ROI renovations.
- The consultancy success not only benefits Finsco and its clients but also stimulates economic growth through increased renovation and property transaction activities.

# 4

## Data & Methodology

### Data

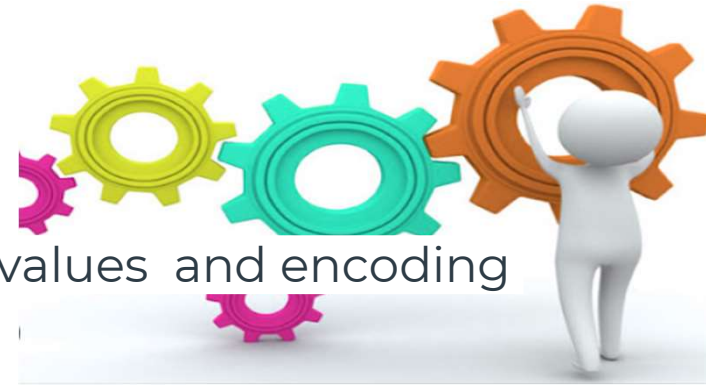
- Data provided was King County House Sales data collected from 2014 and 2015.
- The target variable from this dataset is the property prices.
- Main factors affecting the price are sqft\_living, bathrooms, bedrooms, condition, sqft\_lot, floors and year\_blt

### Limitations

- Dealing with missing values in some of the predictor variables like waterfront and view.
- Non-numerical variables. which have to be encoded before in building our model

# 5

## Methodology

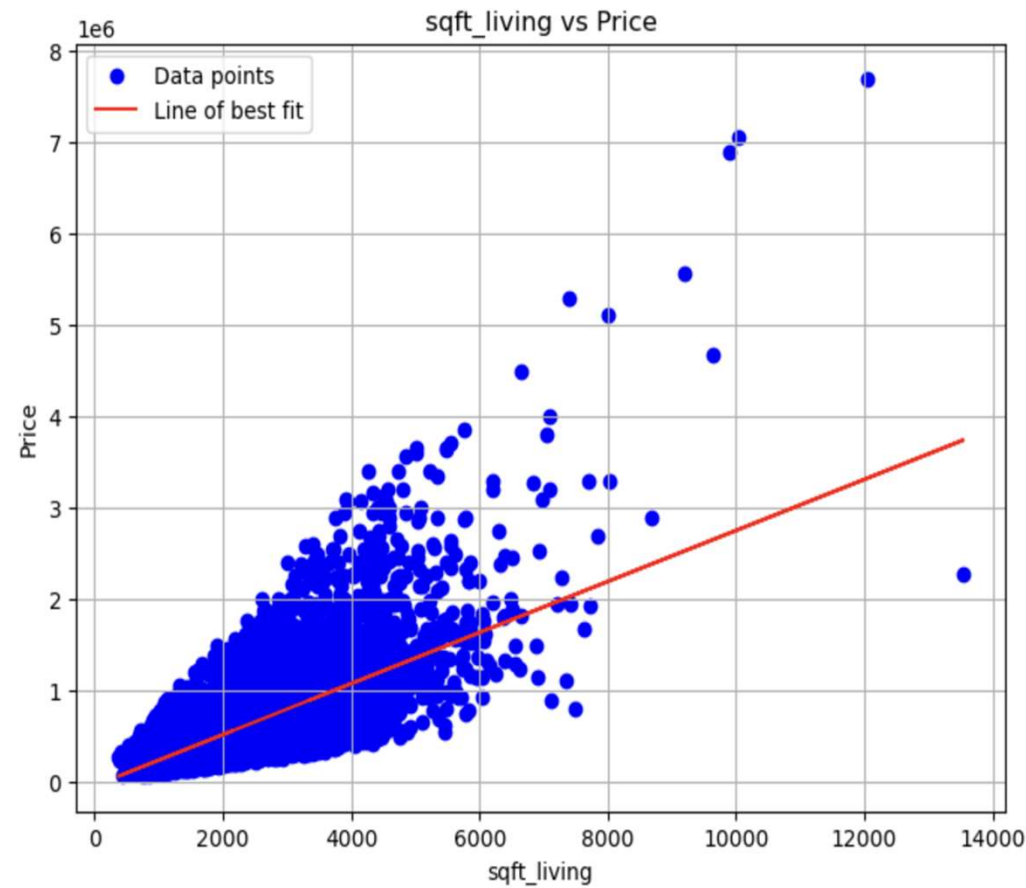
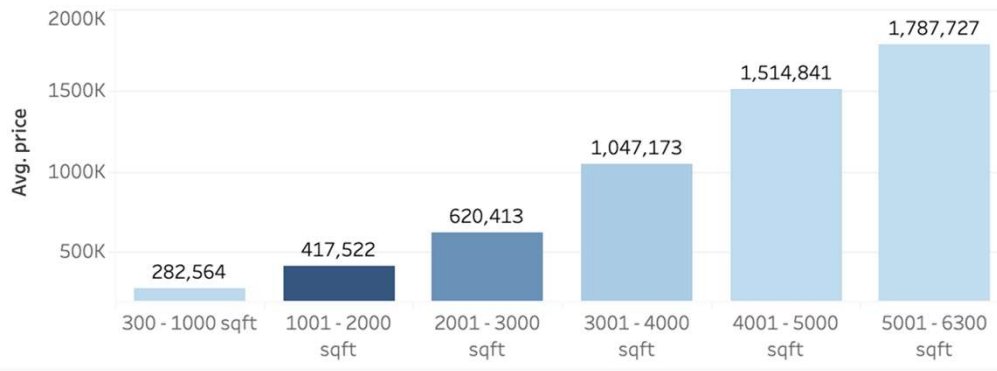


- **Data cleaning:** Handling duplicates, missing, null values and encoding categorical variables
- **Data visualization:** Heatmaps, Histograms, Tableau, scatter plots and linear regression models
- **Simple Regression:** Predicting price variable using one independent variable e.g. sqft\_living, bathrooms, bedrooms (Baseline Model)
- **Multiple Regression:** Used to predict our price using two or more independent variables e.g. sqft\_living, bathrooms, bedrooms

## 6 Results

- Increase in living area size increases property price
- For 1 additional square feet, the home value increases by USD 279

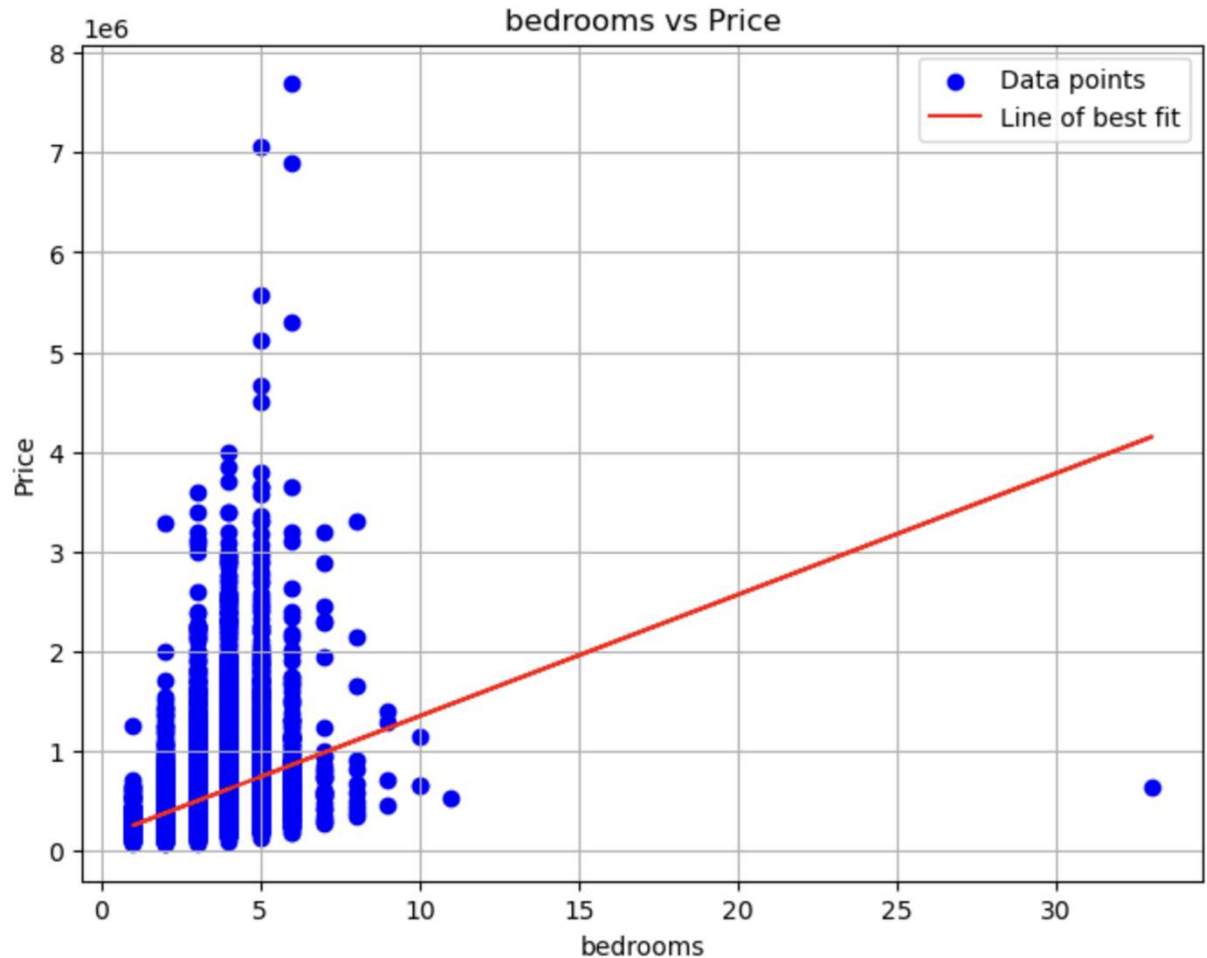
*Average house price vs Sqft\_living*



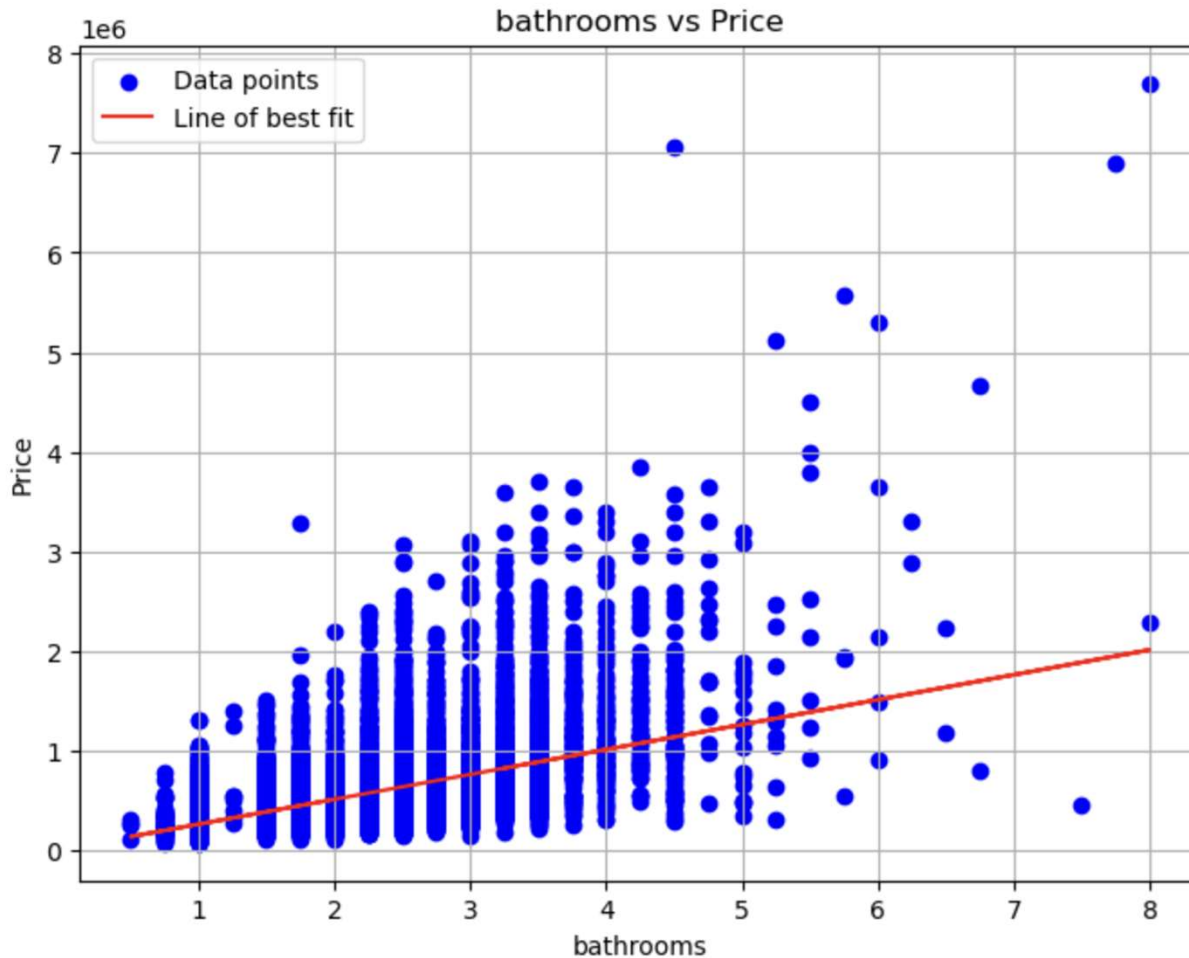


## 7 Results

- Properties with more bedrooms, have a higher price.
- Clients prefer 3 to 6 bedrooms
- 1 additional bathroom, can increase the property price by USD 121,794



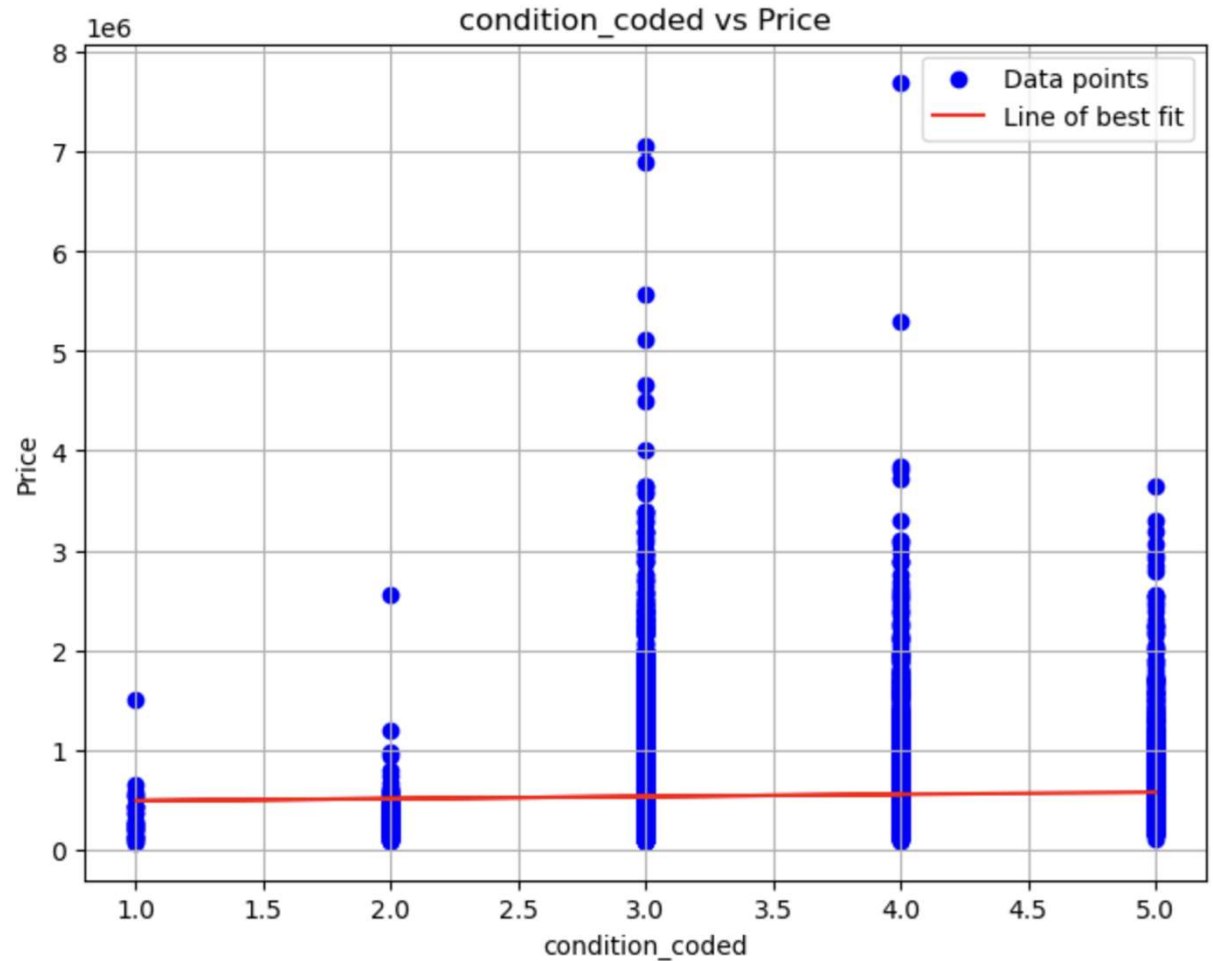
## 8 Results



- More bathrooms increase house prices.
- 1 additional bathroom, can increase the price by USD 250,000

## 9 Results

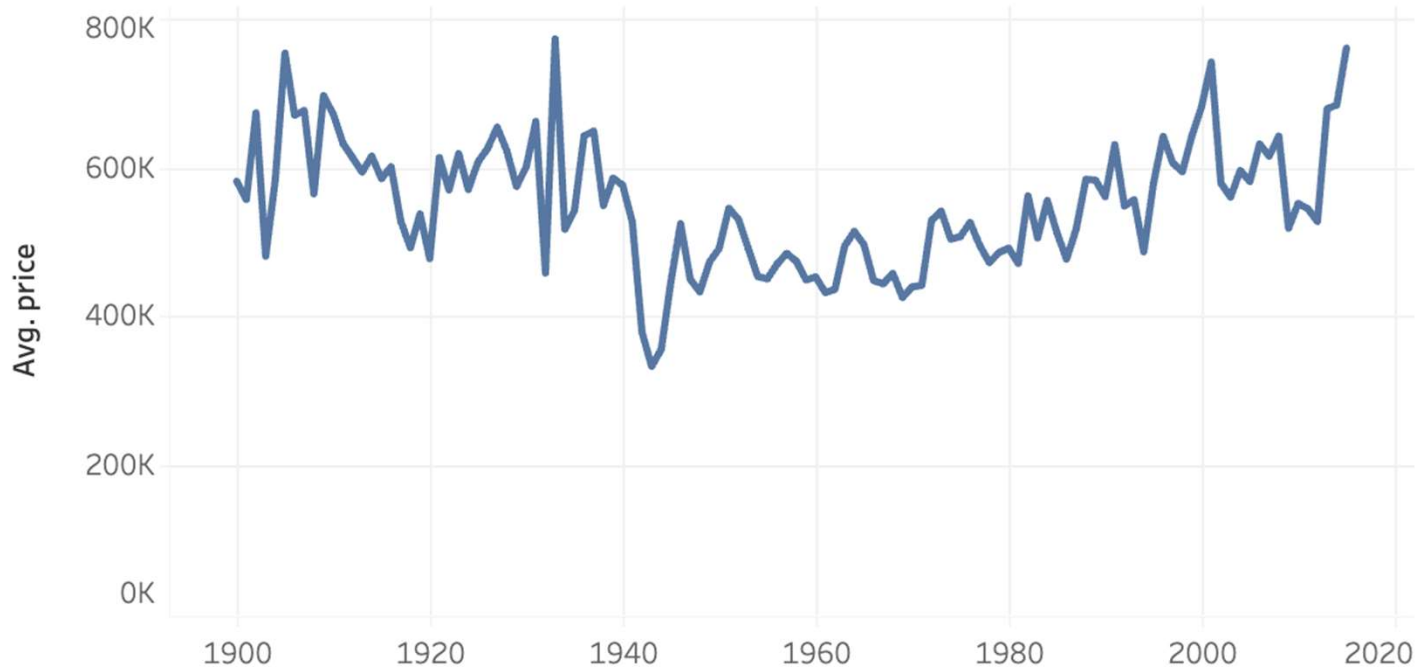
- A well maintained house will have more value
- Improving house maintenance can increase the property value by USD 21, 460



# 7

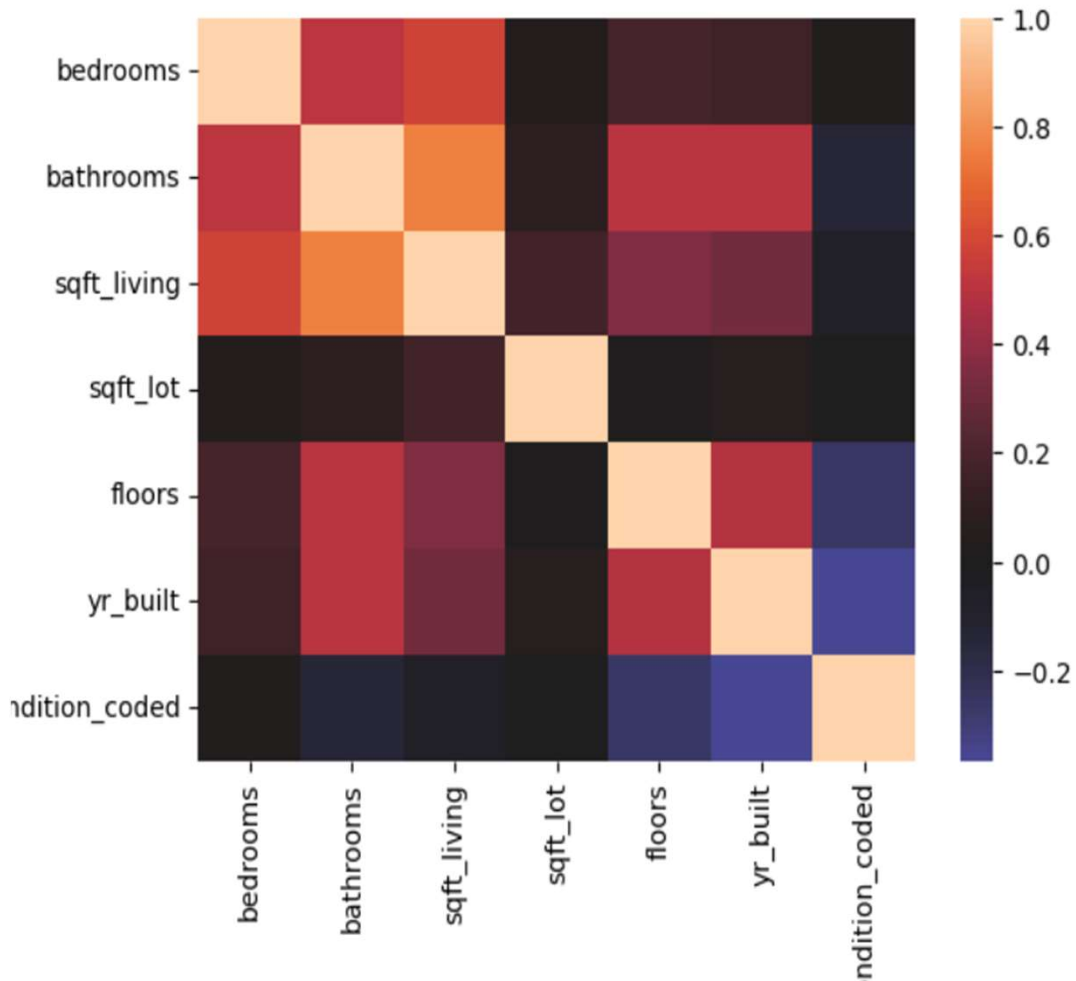
## Results

*Average sales by year built*



- Houses built around 1930 and in the 21'st century have a high sale value

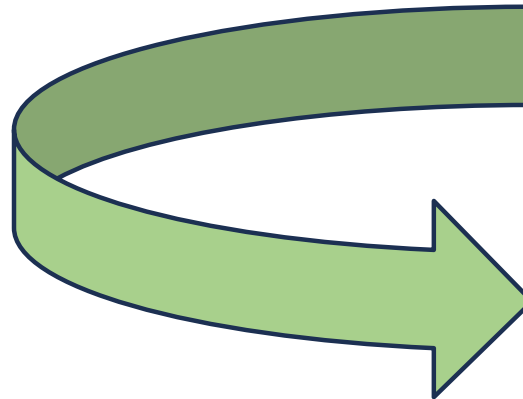
# Data Visualization



- Living room size, bathrooms and bedrooms have the highest effect on the value of the homes
- The year the house was built and overall condition of the house have the least effect on the price

## 9 Conclusion

- From the analysis and model summary, it can be concluded that the proposed multiple linear regression model can effectively analyze and predict the housing price.
- Overall house improvements will have a better impact on the value of the property than just renovating part of the house



## 10 Recommendations

***Finsco Limited advise to its client:***

- **Increase the size of the living room (sqfit\_living).** Bigger living spaces attract high prices.
- **Upgrading bedrooms.** Investing in bedroom renovations, will increase the value of the property.
- **Good house maintenance will improve the value of the homes.** Home owners should ensure their homes rated average and above to improve the home value
- **Bathroom is a minimum requirement and significant item in determining the home value.** Assumption is that “advanced” / “more’ bathrooms attract higher prices

## 11 Next Steps

- **Feedback gathering:** Hepta team will gather feedback from the Finsco team for additional requirements and feedback.
- **Market Research:** We will conduct market research to identify trends in the real estate market such as renovations and, property features demands.
- **Data Enrichment:** Gather additional data on other features that affect property values. This may include users' preferences and more sales and renovations data.
- **Model improvement:** Our Data scientists will try other regression algorithms for comparisons and model improvements





**Thank You**

**Group 8 Phase 2 Final Project**

