

REAL ESTATE MARKET ANALYSIS FOR KING COUNTY, WA





The Scope:

- Overview & Business understanding
- Data understanding
- Visual Data
- Data Analysis
- Modeling and regression
- Summary of Findings and Recommendations



Overview and Business understanding

The project aims to equip Nara Real Estate with insights and strategies to enter the King County real estate market. By leveraging data-driven analysis and market intelligence, the project will provide actionable recommendations to navigate the complexities of the local market landscape. The project addresses challenges such as the dynamic nature of the market, economic conditions, demographic shifts, and location-specific elements on housing preferences and demand. The objectives include understanding house features affecting prices, seasonal impact on house sale prices, market trends and property value, and locations with the highest average house prices. The data-driven approach will help Nara Real Estate achieve sustainable growth and enhance their penetration of the King County real estate market.



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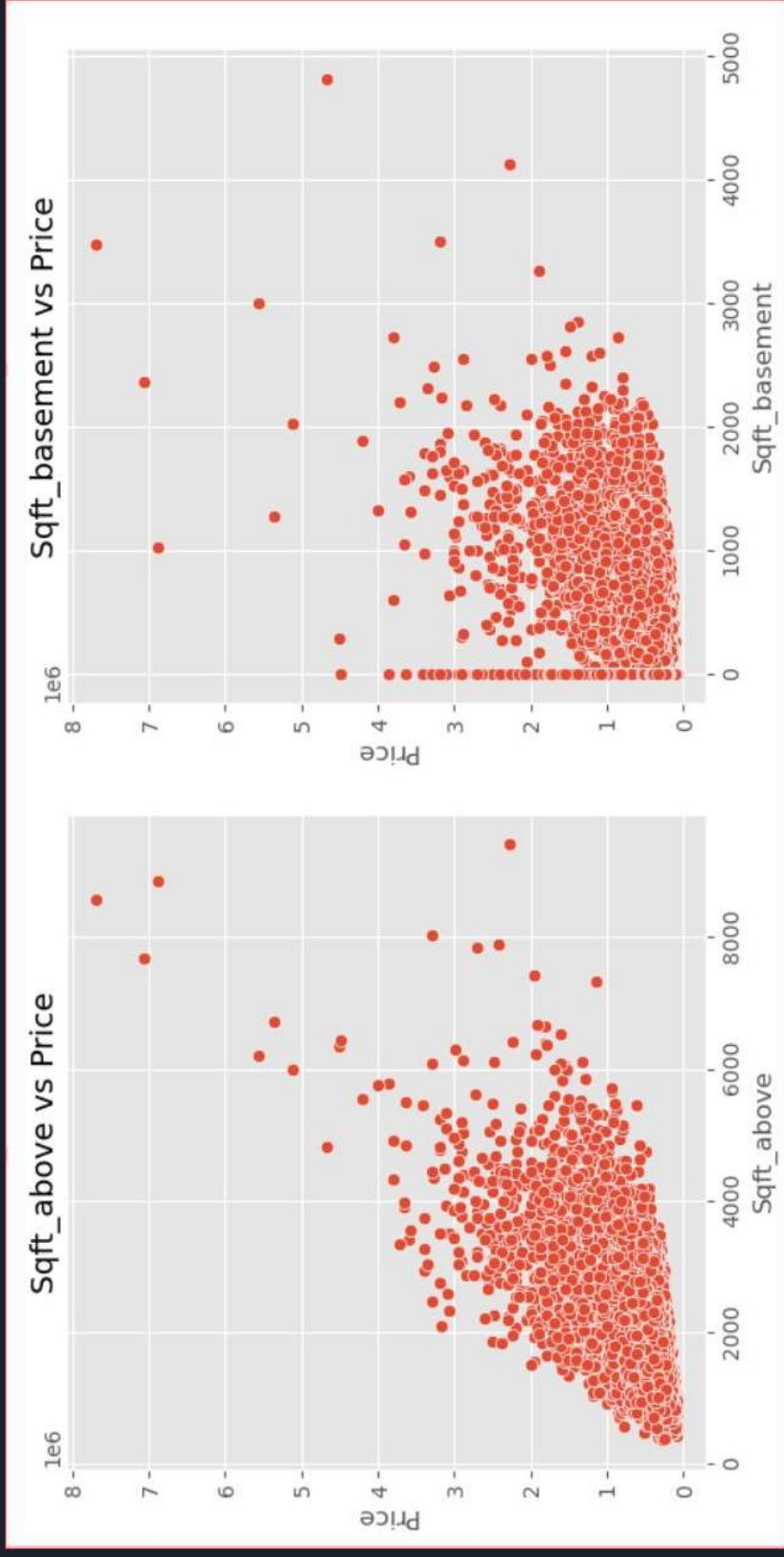
Data Understanding

We used a dataset containing detailed information about individual properties in King County, including attributes such as square footage, number of bedrooms and bathrooms, location, and sale price. Key columns include id, date, price, bedrooms, bathrooms, living area, lot, floors, waterfront view, condition, grade, above ground level, basement, year built, renovated, zipcode, latitude, long coordinates, and average square footage of interior housing living space and land lots for the nearest 15 neighbors as the sample below.

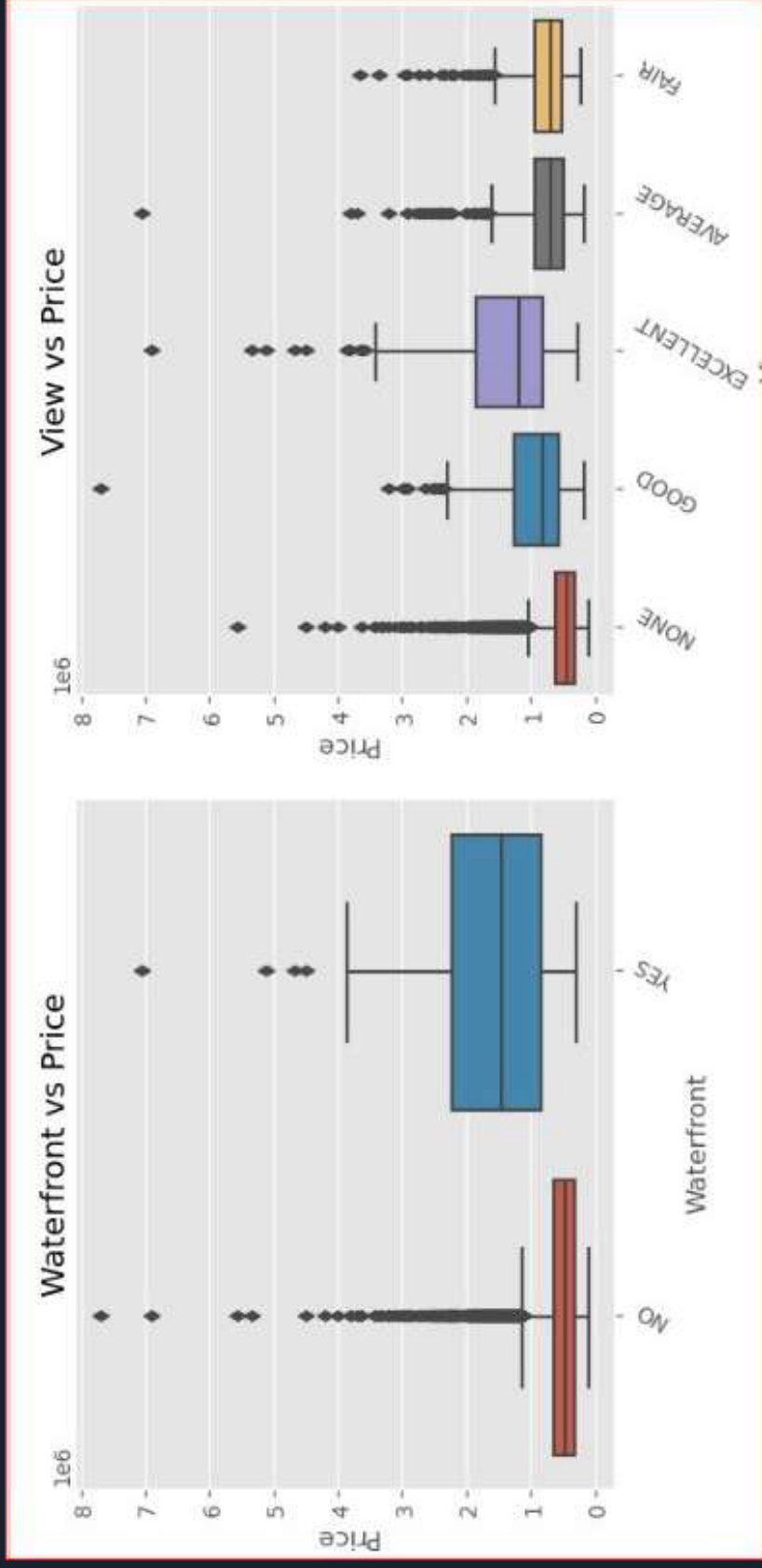
date	price	bed	bath	sqft_living	sqft_lot	floors	grade	sqft_above	sqft_bm	yr_built	yr_renovated	zipcode	sqft_livin	sqft_lot15
10/13/2014	221900	3	1	1180	5650	1	7 Average	1180	0	1955	0	98178	1340	5650
12/9/2014	538000	3	2.25	2570	7242	2	7 Average	2170	400	1951	1991	98125	1690	7639
2/25/2015	180000	2	1	770	10000	1	6 Low Average	770	0	1933	NaN	98028	2720	8062
12/9/2014	604000	4	3	1960	5000	1	7 Average	1050	910	1965	0	98136	1360	5000
2/18/2015	510000	3	2	1680	8080	1	8 Good	1680	0	1987	0	98074	1800	7503

The data also includes the year the house was built and renovated, the zipcode, latitude, and long coordinates of the house. The project aims to provide a comprehensive understanding of the properties in King County.

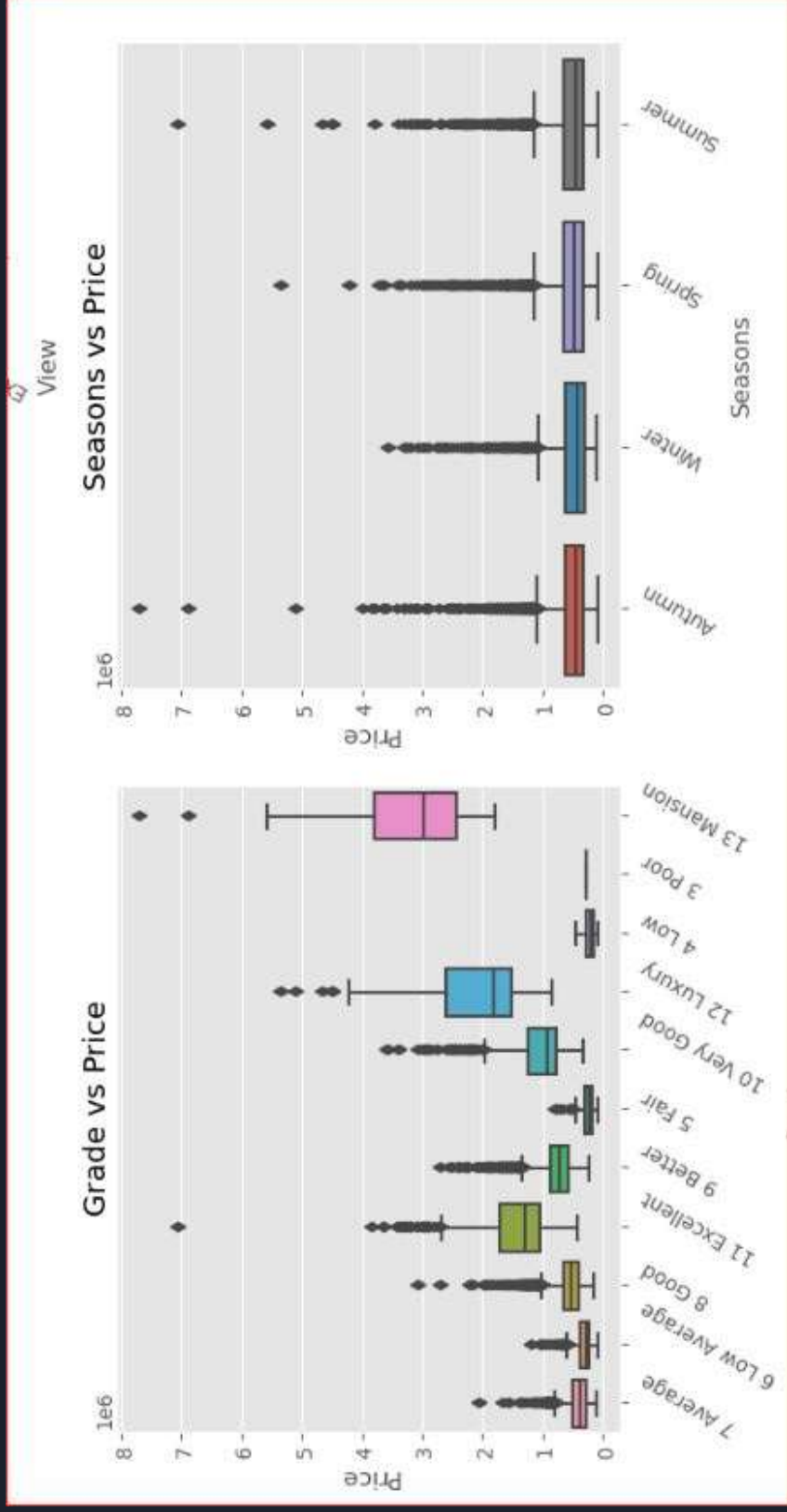
Visual Data



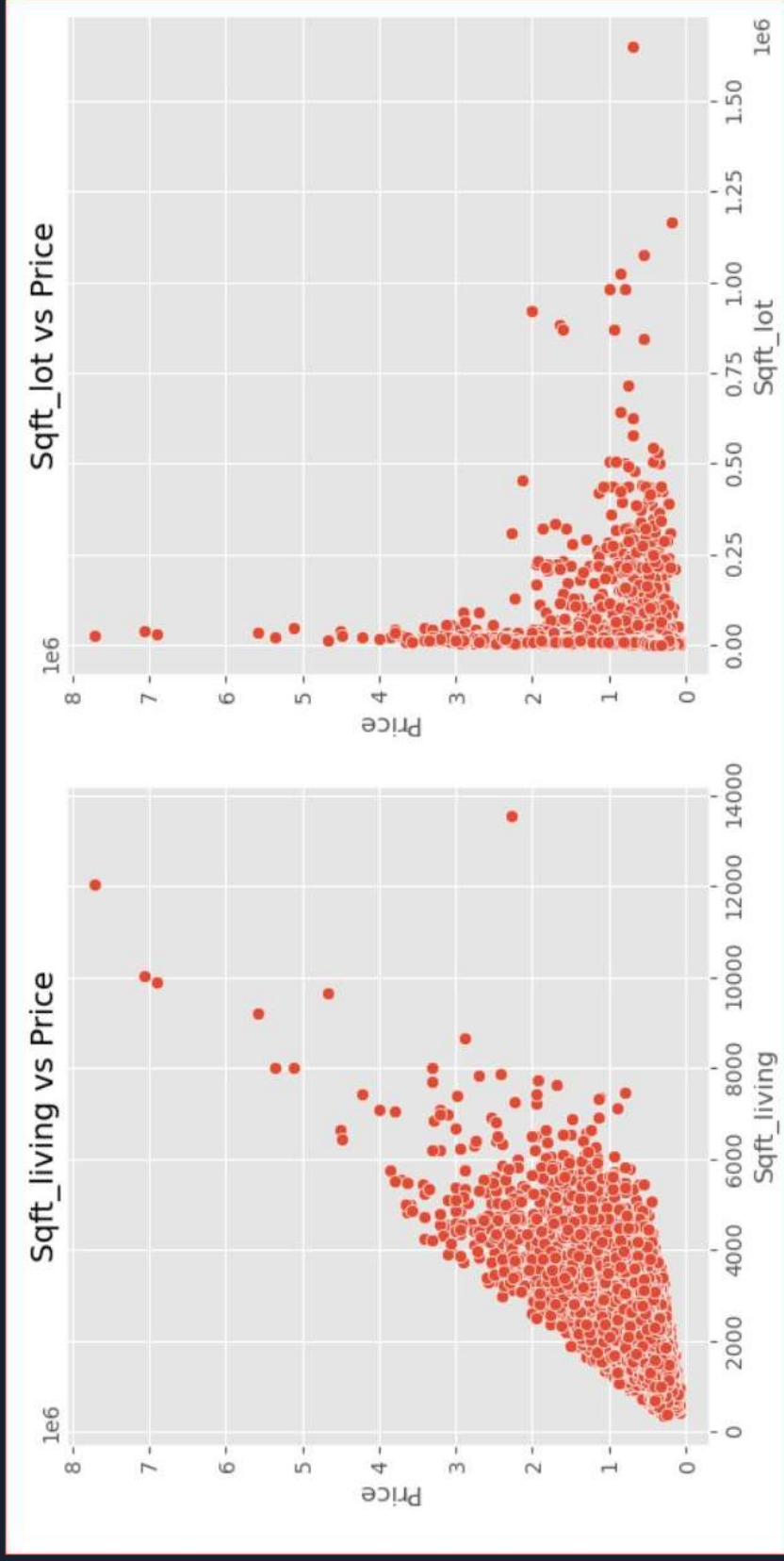
Visual Data



Visual Data

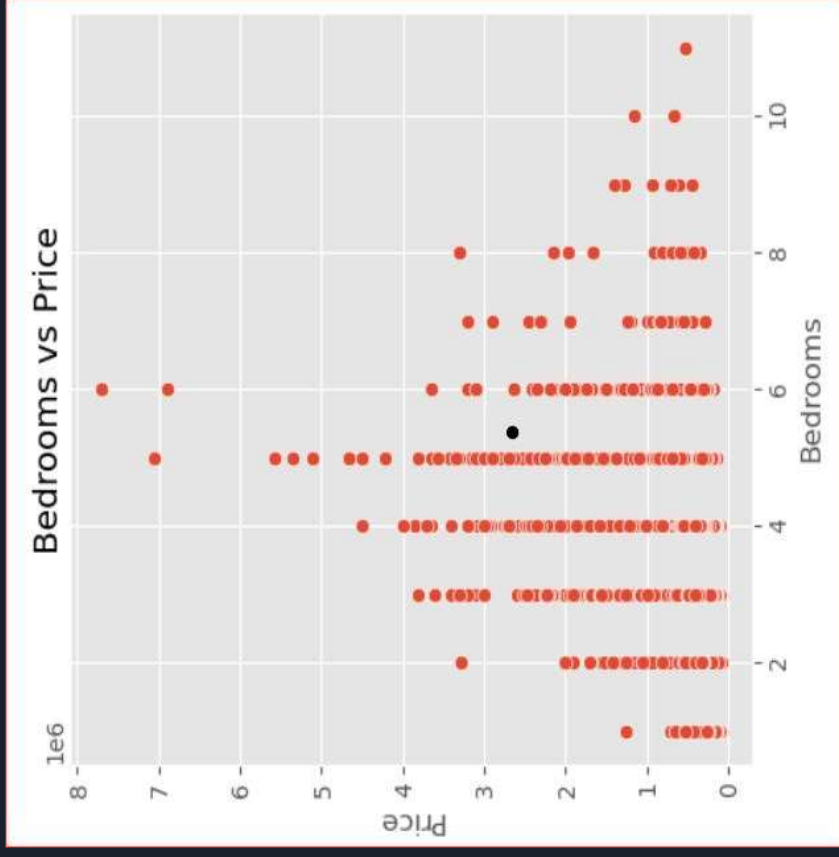
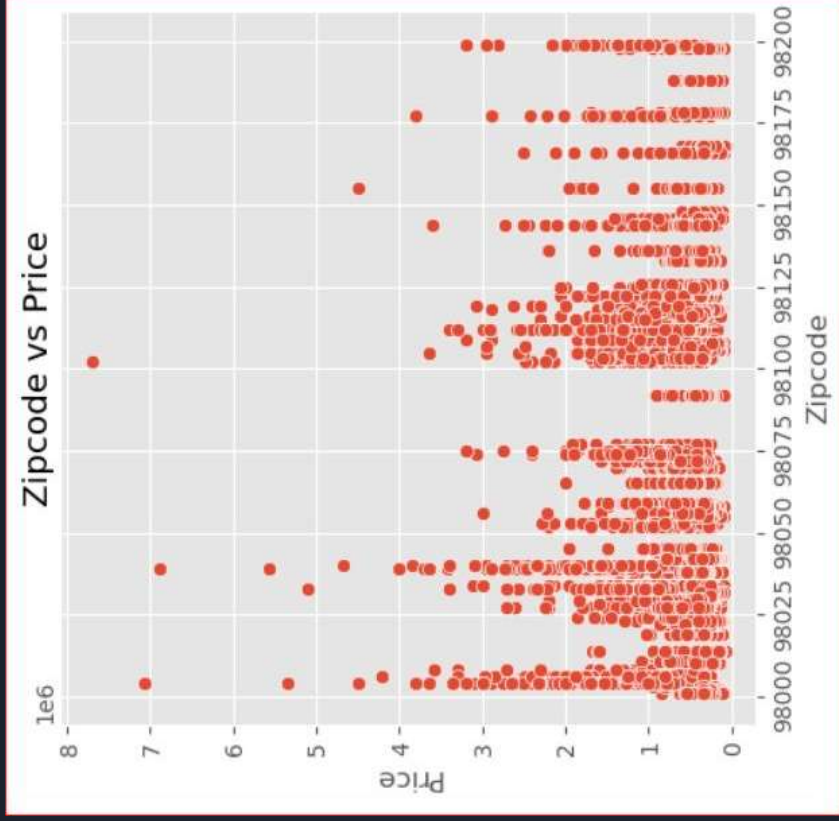


Visual Data





Visual Data





Data analysis

- Price increases with number of bedrooms in a linear manner peaking around the 6 bedroom mark before a steady decline.
- Larger living spaces correlate with higher prices.
- Lot size may not be as influential on price.
- More above-ground space correlates with higher prices.
- Certain zip codes have higher median house prices.
- Location plays a crucial role in determining house price.



Data analysis

We found that some of the categorical features that affect the above cases are:

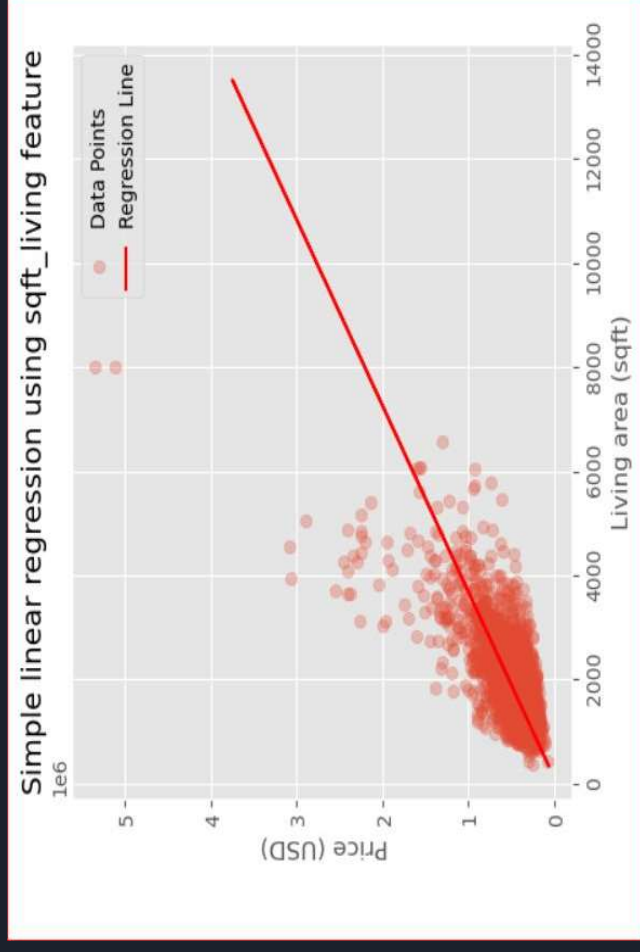
- Waterfront homes are more expensive than those without.
- Quality of views significantly impacts price.
- Home condition moderately influences price.
- Higher-graded homes, especially those rated as Mansion or Luxury, fetch higher prices.
- Peak home sales typically occur during spring and summer.



Modeling & Regression

We use a regression model to indicate whether changes in the dependent variable are linked to changes in one or more of the explanatory variables. Before starting the modelling process, we found it crucial to establish models that meet specific criteria. Through three models we worked from a generalised aspect Model to the most accurate and complex. A final linear regression model was created to understand how the square footage of living space impacts pricing levels and market trends.

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Modeling & Regression

	Model	Description	Num Features	R-squared	Adj R-squared	RMSE	RMSE sd
0	Model-A	Sqft_living	1.0	0.492	0.492	260700	12958
1	Model-B	Limited one-hot encoding	21.0	0.680	0.680	207912	11000
3	Model-C	Further one-hot encoding	145.0	0.819	0.818	167548	15000
4	Model-D	After Log Transformation	145.0	0.820	0.818	167432	15002

The table shows that our model has shown improvement in hours, with an increase in R-squared and a reduction in RMSE.



Summary of Findings and Recommendations

- Targeting houses with higher bedroom counts for a campaign.
- Factors influencing house prices: square foot living, age, good condition, and waterfront living.
- Seasonal factors like warmer weather and school year impact home sales.
- Linear regression model developed to understand square footage's impact on pricing and market trends.
- Importance of waterfront living: median house prices almost double without.
- Future research: calculate time to downtown Seattle, understand income distribution, examine longer time spans, school rankings, and investigate house architectural shape.



Thank you for your time!

