



Home Features to Maximize Sale Price

By Aaron Bastian

Outline

- Project goals
- Data
- Analysis
- Results and Recommendations
- Questions



Project Goals

- Discover which features of a home increase its sale value.
- Utilize linear regression to quantitatively define the relationship between each feature and the price of a home.



Why Linear Regression?

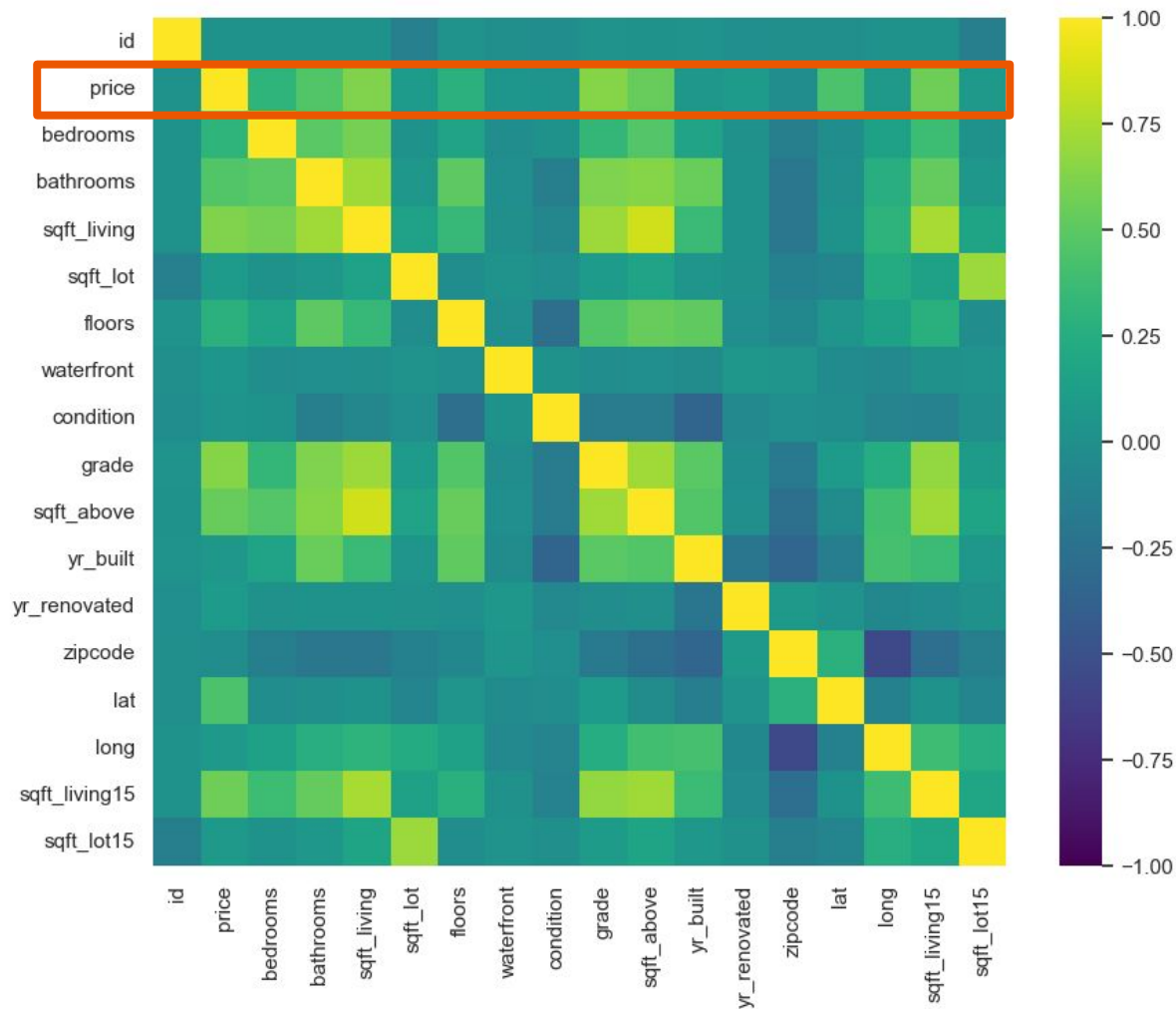
- Allows us to determine the character and **strength of the association** between a house feature and price.
- Allows us to **make predictions** of house prices based upon a custom selection of features.

The Data

- 15.8k house sales in King County, Washington. (includes Seattle)
- Includes homes sold between May 2014 and May 2015.
- Includes data on amenities, number of bedrooms/bathrooms, square footage, renovations, location, and views.



Discovering Features



Features Which Most Strongly Increase Sale Price



- Bathrooms - Number of bathrooms in the house
- Sqft_living - Square footage of living space in the home
- Grade - Construction and material quality (related to construction cost) on a scale of 1 to 13
- Latitude - Latitude of the house (distance from southern parts of the county in this case)
- Sqft_living15 - Square footage of living space for the nearest 15 neighbors
- Floors - Number of floors in the house

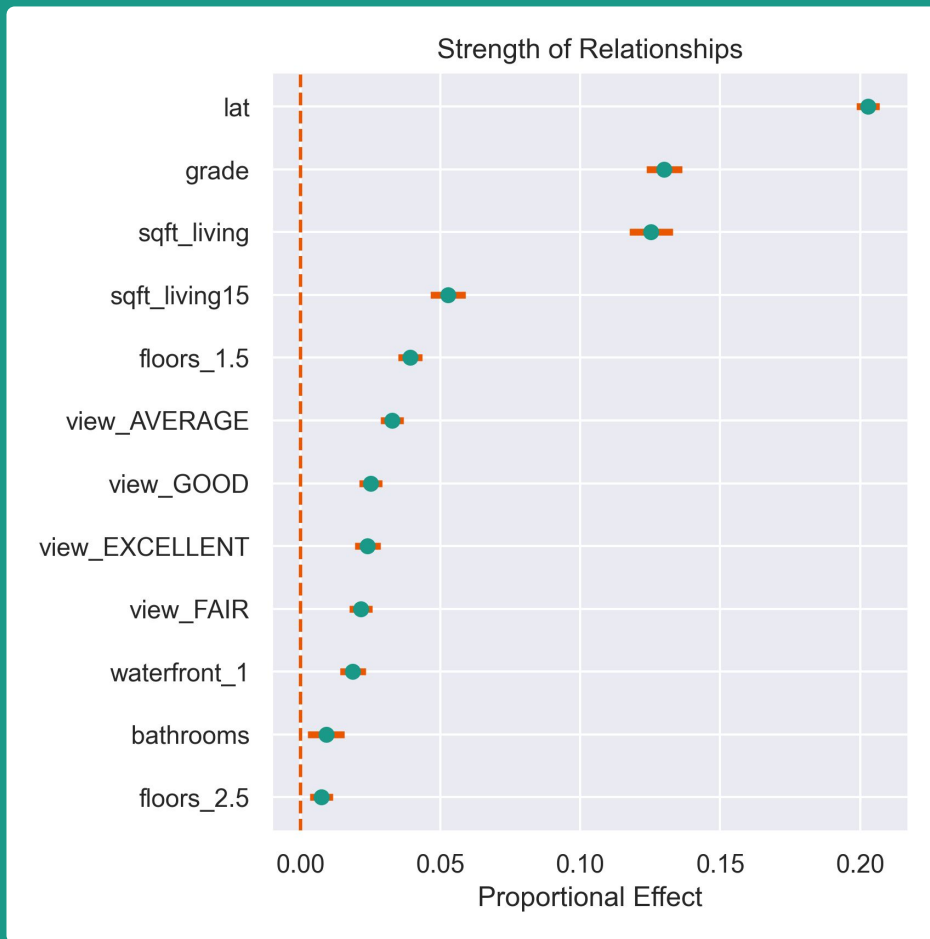


Two Additional Categorical Features

1. View - The views from the house on the following scale
 - a. NONE - FAIR - AVERAGE - GOOD - EXCELLENT
2. Waterfront - Whether or not the house is a waterfront property

Results

- sqft_living, grade, and lat have the greatest proportional effect on price.
 - Of those, sqft_living and grade are the most actionable.
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Sqft_living

Square footage of living space in the home.

Does not include:

- Bathrooms
- Closets
- Halls
- storage or utility spaces

All else held equal:

- For each increase of 1% living square footage, we see an associated increase of ~0.32% in price.
 - Eg. a house with 1.5 (50%) more living square footage should sell for 16% more.

Grade

Represents the construction and material quality on a scale of 1-13. Directly related to the cost of construction

- 1-5 Falls short of minimum building standards.
- 6 Lowest grade currently meeting building code.
- 7 Average quality
- 8 Above average quality
- 9 Good quality
- 10 High quality
- 11-12 Custom design and luxury quality
- 13 Generally custom designed and built. Mansion level. Highest quality.

All else held equal:

- For each additional grade, we see an associated increase of ~13.35% in price.
- Takeaway
 - Spending on better quality construction and higher quality materials is worth the effort and cost.



Recommendations

1. With respect to **sqft_living**
 - a. It would be most profitable to maximize living square footage in any home constructed.
 - b. Prioritize the size of living areas such as living rooms and bedrooms over non-living areas.
2. With respect to **grade**
 - a. It would be most profitable to spend more on higher quality construction materials and experienced contractors.
 - b. This will need to be something decided by the individual construction company and their respective budgets.



Discussion and Caveats

- Several of the predictors are not particularly useful as they cannot be controlled for.
 - View, waterfront property, latitude, neighbors' square footage.
- The relationship between a home's features and its sale price is not perfectly linear, and other methods such as machine learning may provide better results.

Questions?

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