How to Increase Home Prices

In King County, WA

Prepared for Acme Real Estate Agency

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Agenda

- Business Challenge and Our Approach
- Considerations and Caveats
- Analysis
  - Top 10 factors that increase home price
  - What can homeowners do to increase home value?
- Conclusion
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Business Challenge

Acme Real Estate Association would like to use data to understand how they can serve their customers better. They would like to create marketing and educational materials around factors that affect home prices, as well as enable their team of agents to make informed recommendations to customers what they can do to increase the value of their home.

Our Approach

- We started with data for about 21,000 homes that were sold in King County from mid-2014 to mid-2015.
- We fit a multiple linear regression model to understand not only which features from our data set were correlated with home price separately, but to understand how the features work together. This enabled us to identify the features which have the most impact on price.

Assumptions and Caveats

- For our analysis, we exclude zip codes 98104, 98101, 98121, 98174, 98154, 98164, which are in downtown Seattle. This analysis represents other zip codes in King County.
- Dollar amounts mentioned in our model should be understood in relation to our model's baseline. The model's baseline is a house that costs about $223k and has the following characteristics:
  - 0 sq ft living, 0 bedrooms, 0 bathrooms, no basement, no views, not on the waterfront
  - Located in a zip code with average home prices, with average grade , average condition, and single storey.
- This model is suitable for inference, not prediction. All changes in price compared to baseline mentioned here are estimates, and may not accurately describe the increase in price of a house that differs from the baseline.

Analysis

Top 10 Characteristics that Increase Home Price

- Having more square footage of living space is the top predictor of increased price

- Above-average Grades of 9 or 10 are the next most impactful (7 is average)

- Living in certain zip codes also have some of the largest positive impacts on home price


Top 10 Predictors of Increased Price
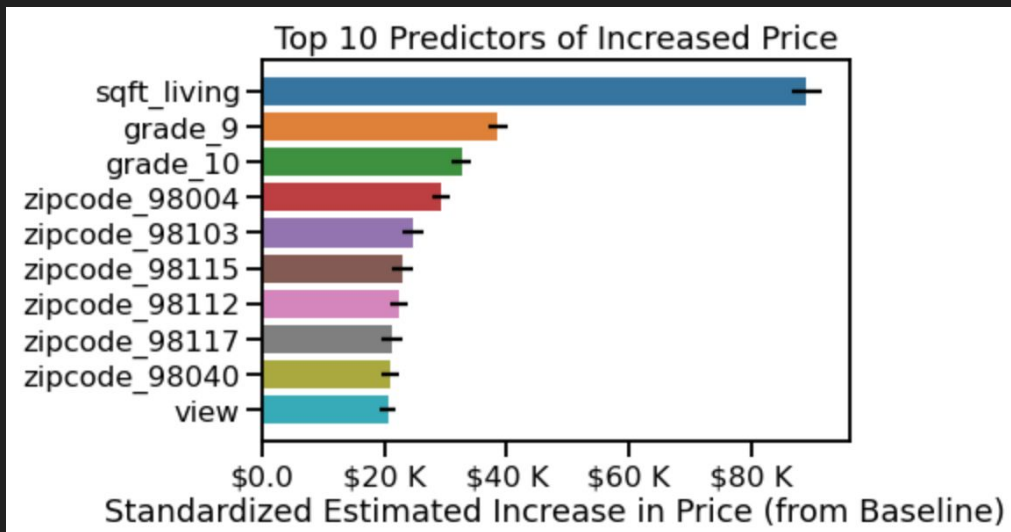
Adding Square Feet of living space increases Price the most

- For every sq. ft. of living space added to a home, we would expect to see an average increase in price of $115 from the baseline

- Adding sq. ft. to a house increases price regardless of number of bedrooms

- However, adding finished sq ft to a home may not be feasible for all homeowners, and the expected cost of renovation should be considered against any estimated price increase.

Sq. Ft. Living versus Price
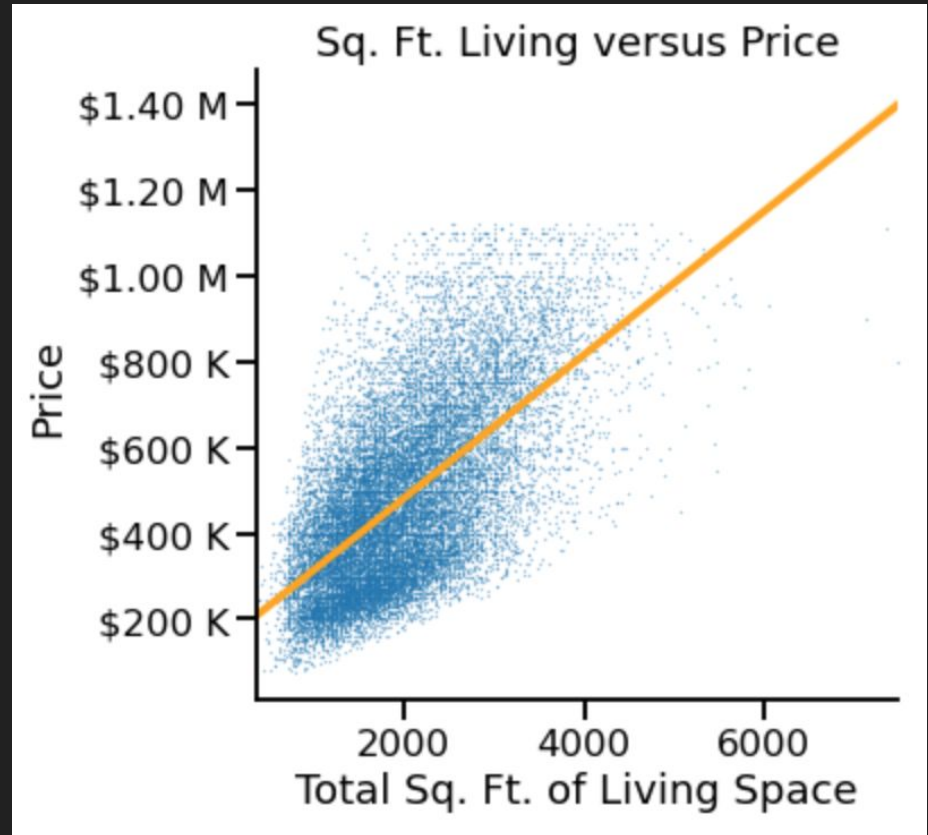
# Increasing Grade may be the most cost effective way to increase home value

- Grade represents quality of construction, workmanship, design, and finishes, where a Grade of 7 represents the average.

- A below average Grade score will detract from the baseline price, and an increase in each Grade level increases baseline price.

- Homeowners may find it simpler to renovate the finishings and craftsmanship of their home than it is to add sq. ft. Even an increase in a single grade level can make a difference.

- A home in above average Condition also increases price, but not as much as above average Grade

Estimated Change in Baseline Price per Grade or Condition
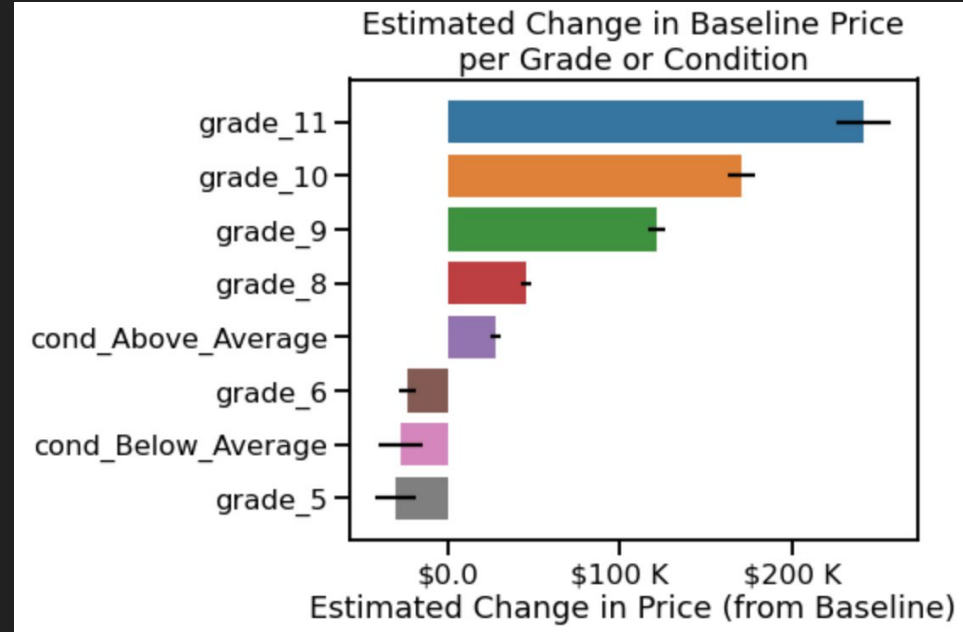
Considerations for room additions

- Interestingly, adding a bathroom is the only variable we analyzed that increased price without changing anything else, such as adding more square feet.

- We can interpret this by concluding that the other types of additions also require adding square feet to increase price.

- When calculating cost versus estimated price increase for additions, homeowners should consider whether they're adding enough square feet.

Estimated Change in Baseline Price for Additions
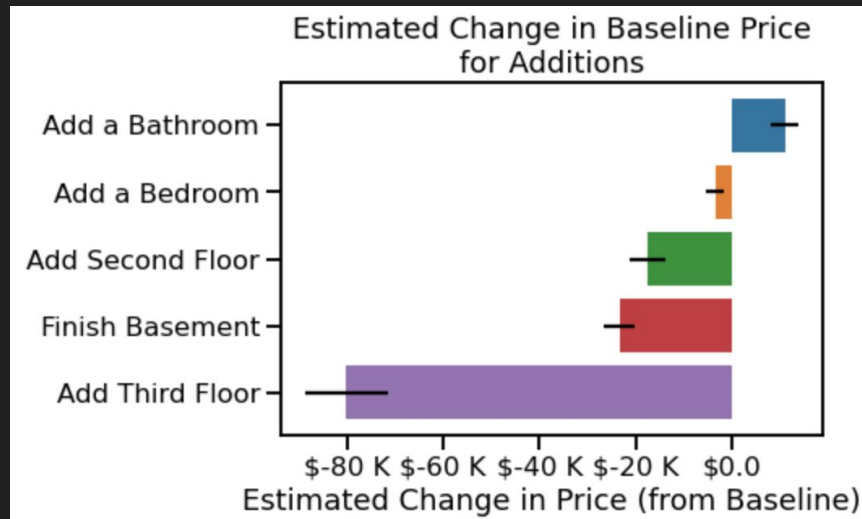
	Suggested Minimum Square Feet to Add
Add a bedroom	30.5
Add a second floor	153.5
Finish Basement	203.8
Add a third floor	696

Summary of Recommendations

- Of the home characteristics that homeowners can reasonably affect, Square Footage of living space has the largest impact on price, with each additional square foot translating to an estimated $115 in additional value.

- Grade also has a fairly large impact on price. Homeowners may find they have more flexibility in balancing the costs of a renovation focused on improving Grade, versus a renovation in which more square footage is added.

  - Even an increase in a single grade level can have an impact on price

  - Condition also affects price, but not as much as grade

- When adding rooms, it's important to consider how many sq. ft. will be added. Creating more rooms without adding enough sq. ft. may actually detract from home price, with the exception of bathrooms.

Potential Next Steps

- Although useful for inference, our model may not be the most effective way to model housing data for prediction, and more steps would be needed to test accuracy of predictions.

- As next steps, I would recommend using the same model parameters but properly splitting for training and testing data to determine whether this model would be suitably accurate for predictions.

- If a reasonably accurate model can be achieved, this would enable Acme to make better recommendations for their clients based on the characteristics of their specific home.

Appendix

Grade Score Descriptions

- Grades 1 - 3 Falls short of minimum building standards. Normally cabin or inferior structure.
- Grade 4 Generally older low quality construction. Does not meet code.
- Grade 5 Lower construction costs and workmanship. Small, simple design.
- Grade 6 Lowest grade currently meeting building codes. Low quality materials, simple designs.
- Grade 7 Average grade of construction and design. Commonly seen in plats and older subdivisions.
- Grade 8 Just above average in construction and design. Usually better materials in both the exterior and interior finishes.
- Grade 9 Better architectural design, with extra exterior and interior design and quality.
- Grade 10 Homes of this quality generally have high quality features. Finish work is better, and more design quality is seen in the floor plans and larger square footage.
- Grade 11 Custom design and higher quality finish work, with added amenities of solid woods, bathroom fixtures and more luxurious options.
- Grade 12 Custom design and excellent builders. All materials are of the highest quality and all conveniences are present.
- Grade 13 Generally custom designed and built. Approaching the Mansion level. Large amount of highest quality cabinet work, wood trim and marble; large entries

Condition Score Descriptions

Condition: Relative to Age and Grade

- 1= Poor Many repairs needed. Showing serious deterioration.
- 2= Fair Some repairs needed immediately. Much deferred maintenance.
- 3= Average Depending upon age of improvement; normal amount of upkeep for the age of the home.
- 4= Good Condition above the norm for the age of the home. Indicates extra attention and care has been taken to maintain.
- 5= Very Good Excellent maintenance and updating on home. Not a total renovation.

Sq Feet versus Price per Bedrooms