Reddic Housing LLC

Housing Price Analysis

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Problem and Objectives

We were given information about the houses in the Seattle area and with this information we were asked to use machine learning to make predictions on house prices. In order to do this we will test models on several features and property types of the homes and see which ones have the biggest role when calculating housing prices.

Research and Correlated Features

In our research we have found that the top three major indicators of housing price are the square footage of living space, the quality level of construction and design (grade), and location.

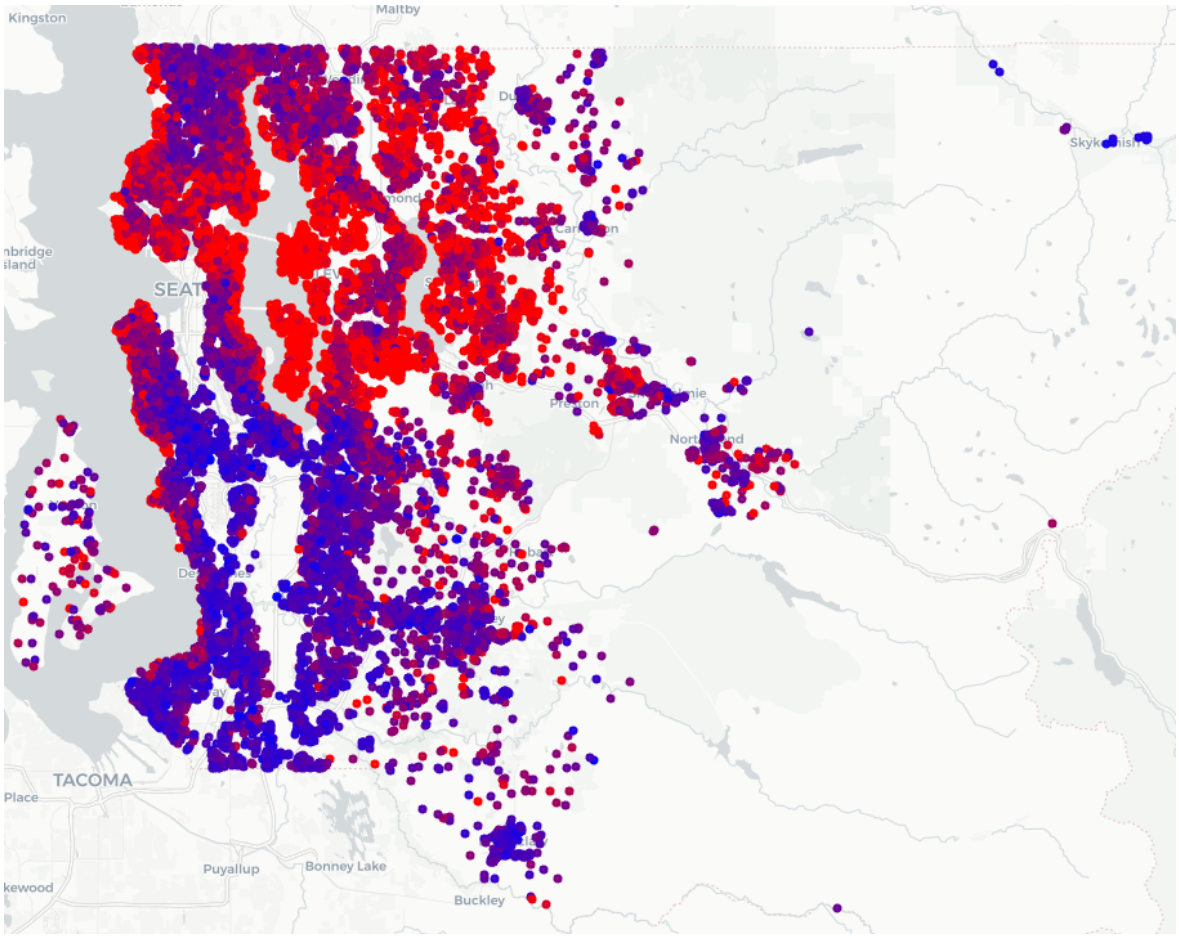

FIG 1 (Red = higher house price)

As seen in figure 1 above, there are certain locations and areas where the prices of houses are much higher. The downtown Seattle area, Capitol Hill, Bellevue, and Mercer Island in particular have exceptionally high housing prices.

In figure 1 also note that most houses located near the water are noticeably higher priced. Unfortunately, the waterfront property feature in the dataset only denotes being directly on the water and doesn't represent the correlation you can see in figure 1.

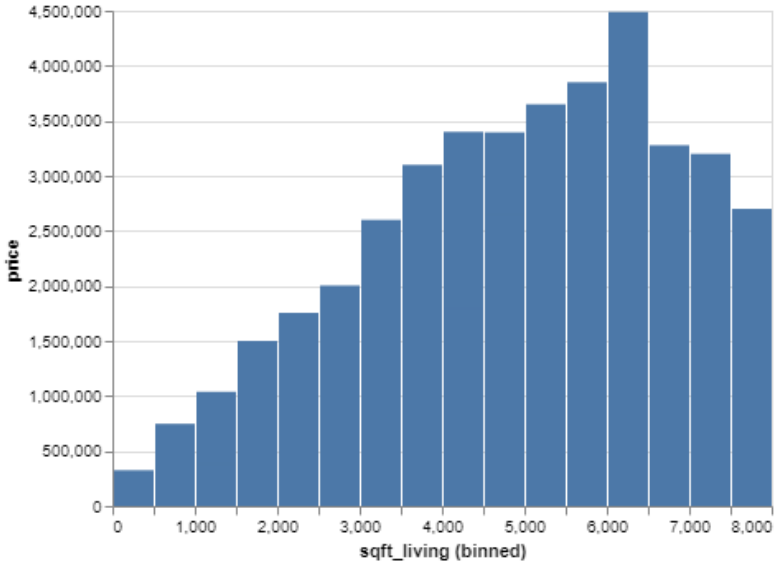

FIG 2

As mentioned above, the square footage of living space has a strong correlation with the house price. You might notice in figure 2 that the house price peaks at around 6000 square ft and then drops a little. In our research, we believe that this is because anything larger than that is not feasible to have located in the aforementioned housing hotspots, as those are densely populated areas.

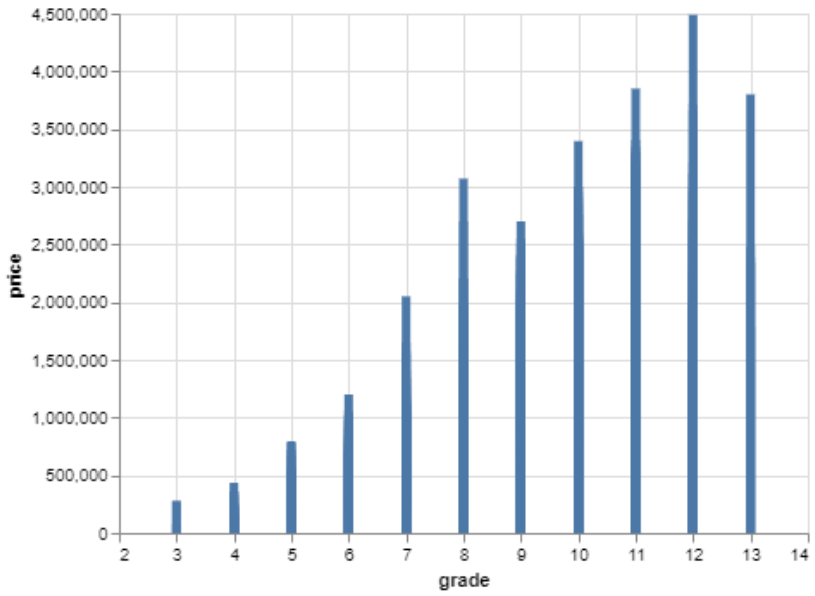

FIG 3

As you can see in figure 3, the grade/quality of the house is quite a straightforward indicator of house price. And unlike the square footage mentioned above, the quality of the house is not limited by size or location, so you can be sure that a high quality house in a hot zone is worth quite a lot.

Using the above findings and other useful data we've found, we created our model. Using this model we can predict any house price to within $105,000 on average. More specifically, for houses worth under $400,000 our predictions can come within $58,000. For houses worth between $400,000 and $600,000 we can predict it to within $66,000. For houses worth more than $600,000 our predictions are within $170,000.

Solutions Value and Conclusion

From our research and testing we have found which property types that affect the price of the house the most. Location has a big influence. Houses in downtown Seattle are far more expensive than houses sold on the outskirts of the city. Especially those found in Capitol Hill, Bellevue, and Mercer Island. Square footage of the house, living square footage in particular, also plays a big role on the house price. And lastly the grade quality of the house, of its construction and design, has a large weight on the house prices. That being said, a model of the location, house grading, and square footage would be the best property types to calculate a price of a given home.

Links

Final: Nathan W

Brandon W:
https://colab.research.google.com/drive/1dotlF_bD8OuInsNhVolIL01NO35TQmrl#scrollTo=mA0HPVmIBT4C

Nathan W:
https://colab.research.google.com/gist/Natosphere/b62fba16ebb62f93c30f590804dc2d36/nathanwheelwright_module2_housingestimates.ipynb#scrollTo=drOhSLJ1R1VM

Alex B:
https://colab.research.google.com/gist/desertalex/84fbce50fb3cfe853dac89ed9b5f6938/copy-of-starter_housing.ipynb

Avery R:
https://github.com/jarreed0/school_stuff/blob/main/starter_housing.ipynb