Final Project: The Factors Influence Miami Housing Price

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Introduction

This analysis uses an extensive database of 13,932 single-family homes sold in Miami to investigate the city's housing market. This dataset explores the several variables that might influence home values. It includes a wide variety of factors, including the total area of the property, location, the distance to important landmarks like railroads and oceans, and more subtle information like the structure quality and the level of airport noise pollution.

Background

Miami is well-known for its dynamic urban life, thriving central business district (CBD), and coastline houses. The geographical position of the city influences the property market; houses close to the CBD and the ocean are in extremely limited supply. Understanding the principal factors that influence the value of homes in Miami is not only of scholarly curiosity but also has realistic effects on several customers, including homeowners, property owners, and urban designers.

Question

Main question: What factors influence the sale prices of single-family homes in Miami?

Method

Download the data

I download data in csv form from Kaggle https://www.kaggle.com/datasets/deepcontractor/miami-housing-dataset

Look at the data

| Total_objects	Total_variables
13932	17

We checked the dimension of our data and noticed that there are 13932 total observations and 17 different factors for each of our observation.

Data analysis

I selected some variables that may affect the house price for further analysis. Then, I did some summaries for the key variables such as the distance to ocean, the distance to railroad, the distance to central business district (CBD), the houses structure quality, and the accessibility of airport noise. Also, I compared the price for land and floor area per square feet to find there is any association between them.

Preliminary Results

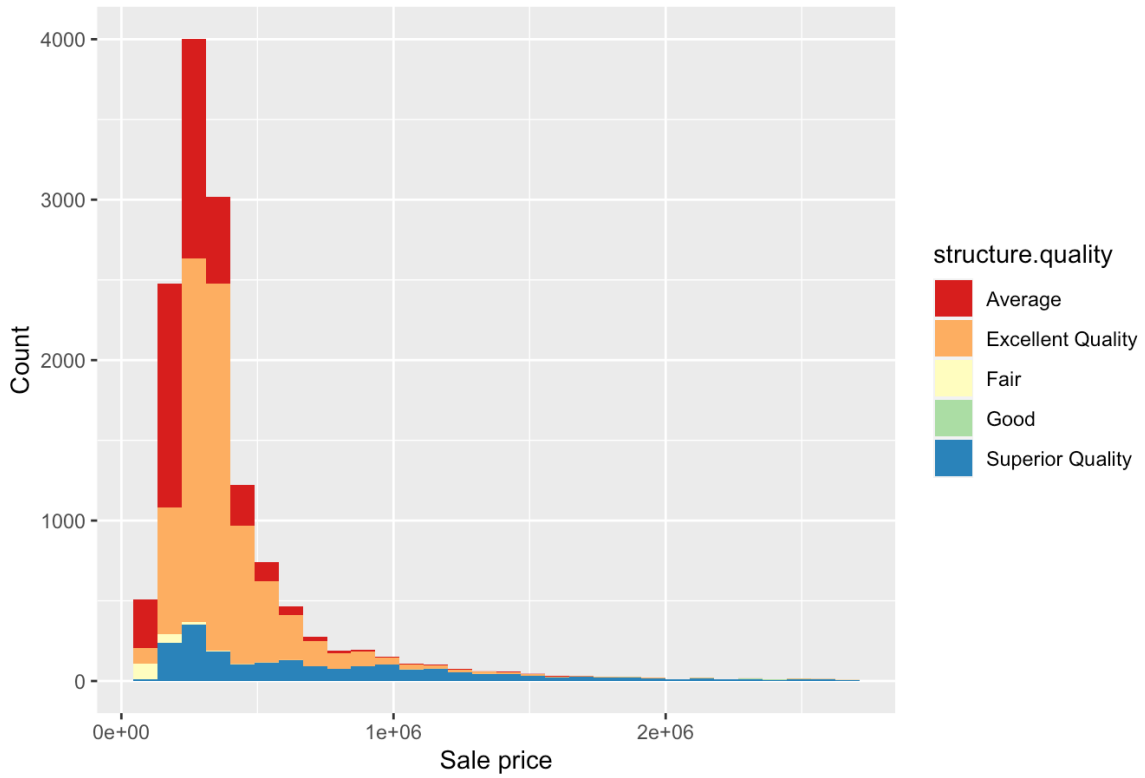## Correlation between ocsan distance and the sale price
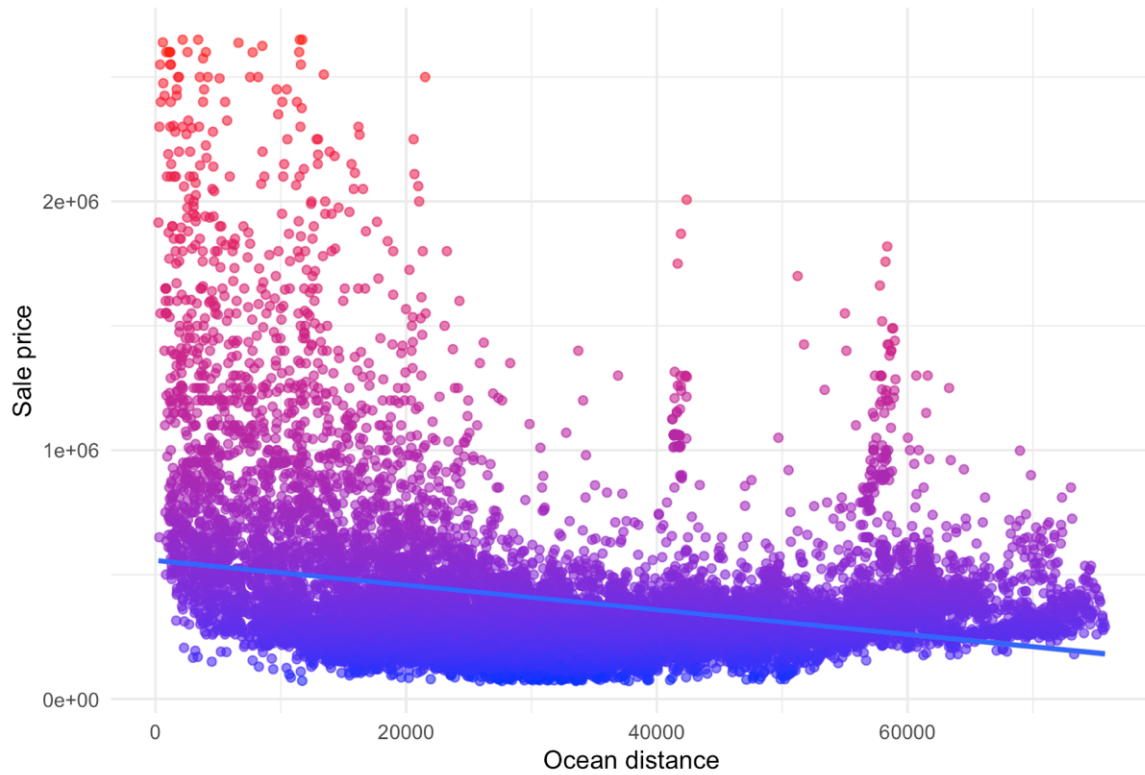
Correlation between the distance to the nearest rail line and the sale price
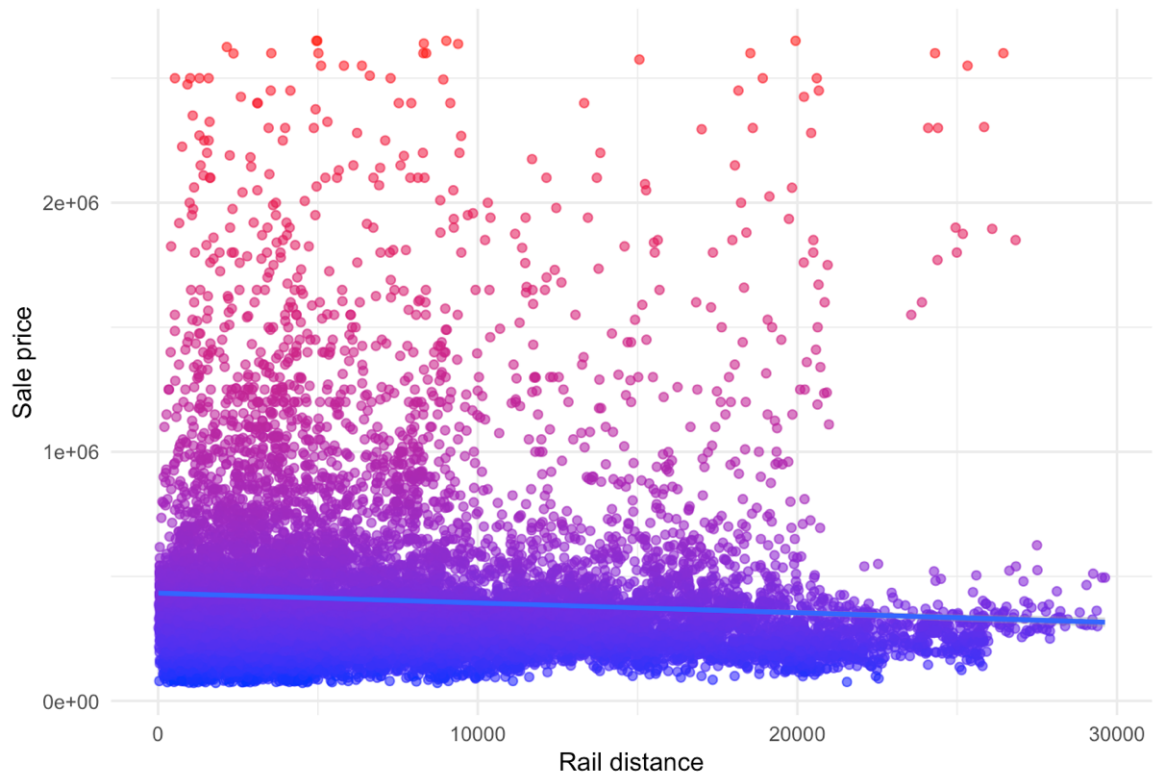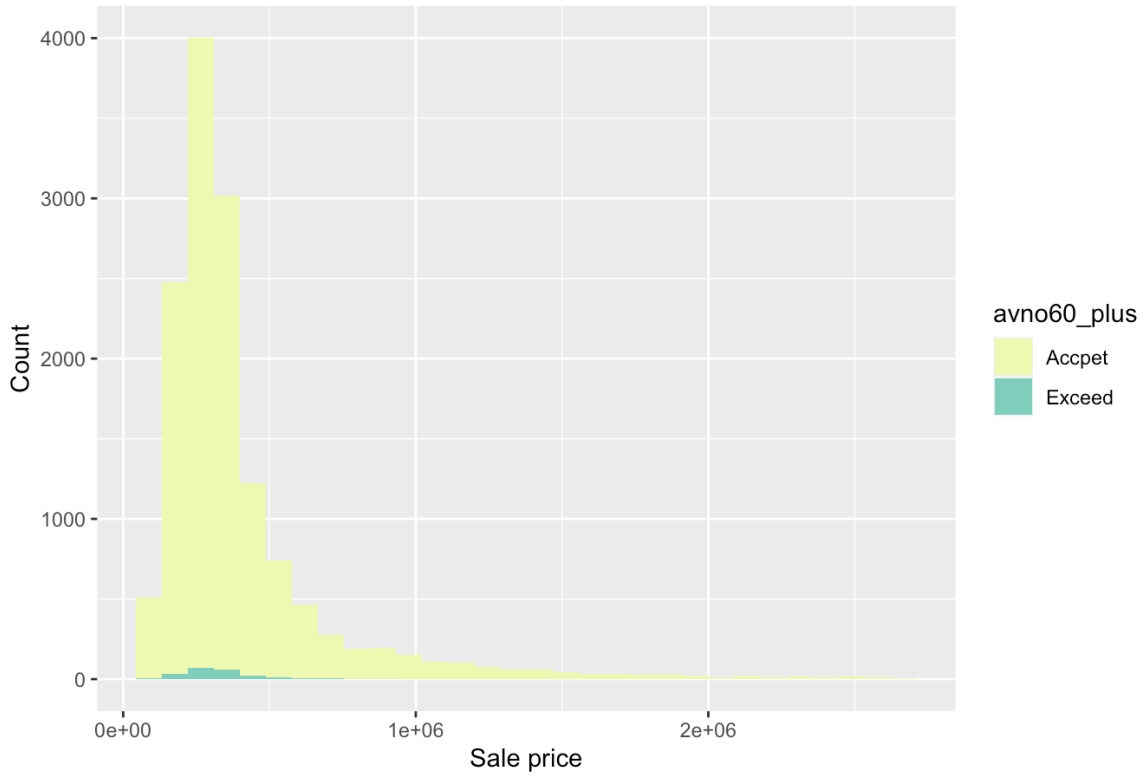
Correlation between the distance to the nearest Miami central business district
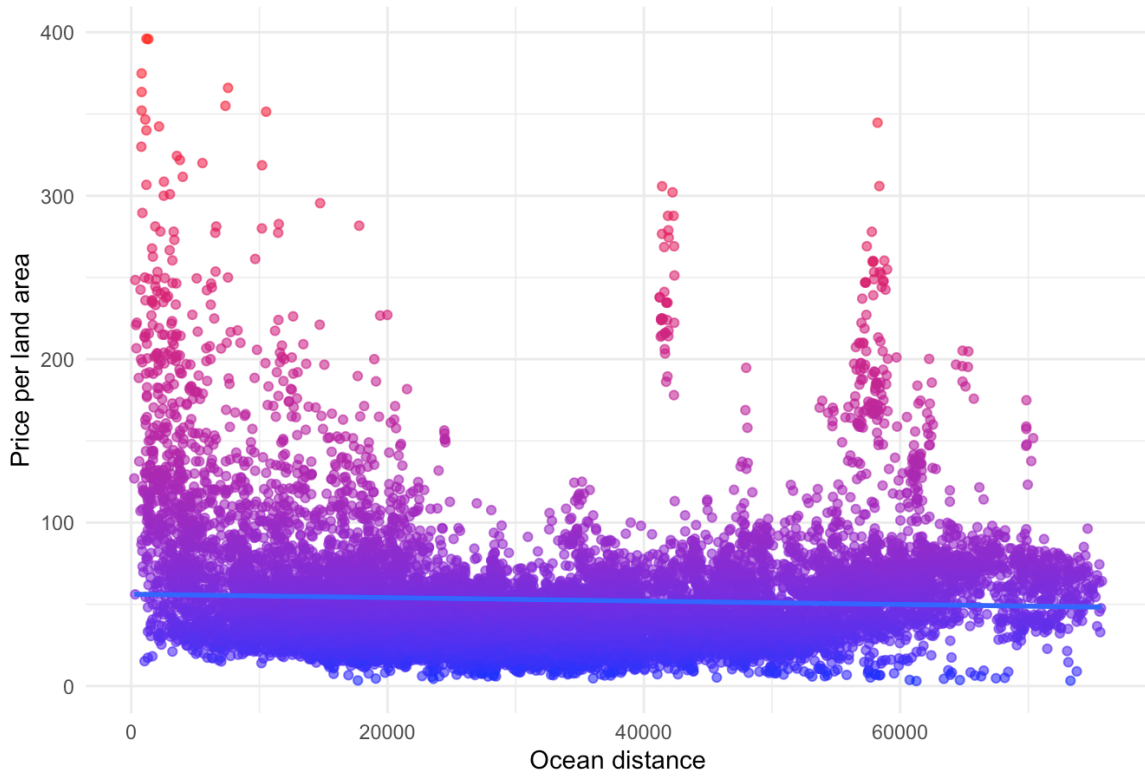

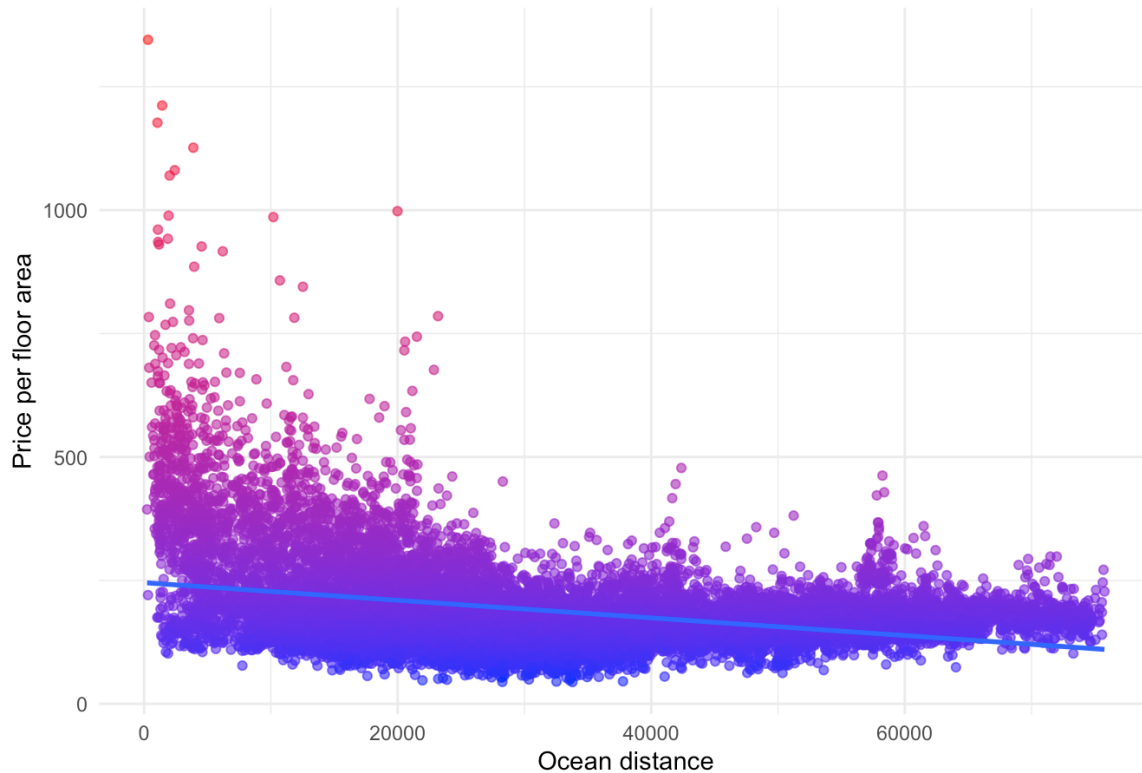## Sale price by struvture quality

Sale price by airplane noise level

Correlation between ocsan distance and the price per land area

Correlation between ocsan distance and the price per floor area

Conclusion

According to Kaggle's Miami Housing Dataset, home values are affected by distance from the ocean, Central Business District, floor area, and airport noise level. Coastal properties are usually more valuable and have better views and amenities. The premium that consumers are willing to pay for the comfort and luxury of beachfront houses is shown by this trend. The Central Business District's location is another important factor influencing housing values. Because the CBD serves as the city's economic center, homes in nearby areas are often more expensive. On the other hand, it seems that property values are least affected when located near railroads. This result implies that the potential negatives of being close to the train are outweighed by other location-based positives, such as being close to the ocean or the CBD.

It's interesting to see that the houses structural quality has little effect on price, implying that consumers prefer location and size over structural quality. This result indicates that Miami consumers are more concerned with a property's size and location than its structural quality. Based on this trend, the market may place a higher value on location and potential than on the condition of the property.

In addition, although it has less impact than being close to the ocean or the city center, airport noise level affects property values. In areas where there is a lot of noise pollution from nearby airports, house prices are usually lower. It emphasizes attention to the compromises that consumers take between living comfort and affordability.

At last, the relative effect of floor area versus land area on property values is a particularly interesting conclusion. According to the plots, price is more significantly impacted by floor area. This preference might result from the fact that a property's useful living is valued higher in high population density or land-scarce places than the total amount of land it occupies. It is typical of urban property markets where effective use of space is necessary.