Exploring Apartment Market Trends

Individual Contribution：

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1. Dataset Description

The dataset contains information about various apartments, with the following key columns:

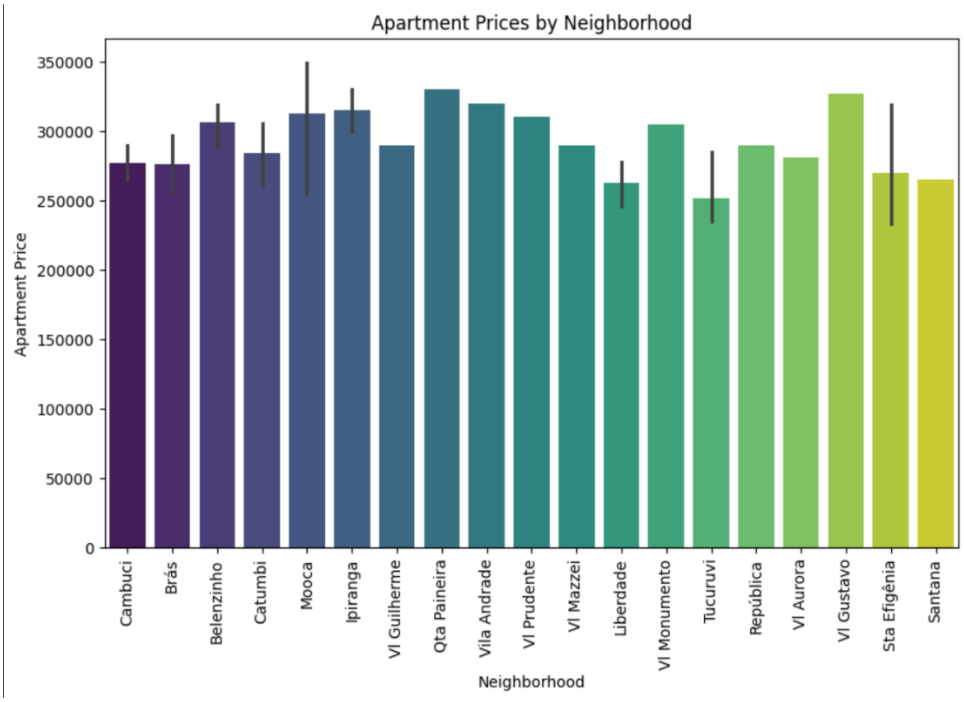
- **neighborhood**: The neighborhood where the apartment is located.
- **apt_price**: The price of the apartment.
- **square meter**: The area of the apartment in square meters.
- **floor**: The floor on which the apartment is located.
- **furniture**: The condition of the furniture in the apartment (e.g., new, second-hand).
- **age**: The age of the building.
- **condominium_fees**: The condominium fees associated with the apartment.
- **parking_spaces**: The number of parking spaces associated with the apartment.
- **windowpane**: The type of windowpane in the apartment.
- **recreation_area**: The availability of recreational space in the apartment.

2. Visualizations and Methods Used to Create the Visualizations

To gain insights from the dataset, we created the following visualizations:

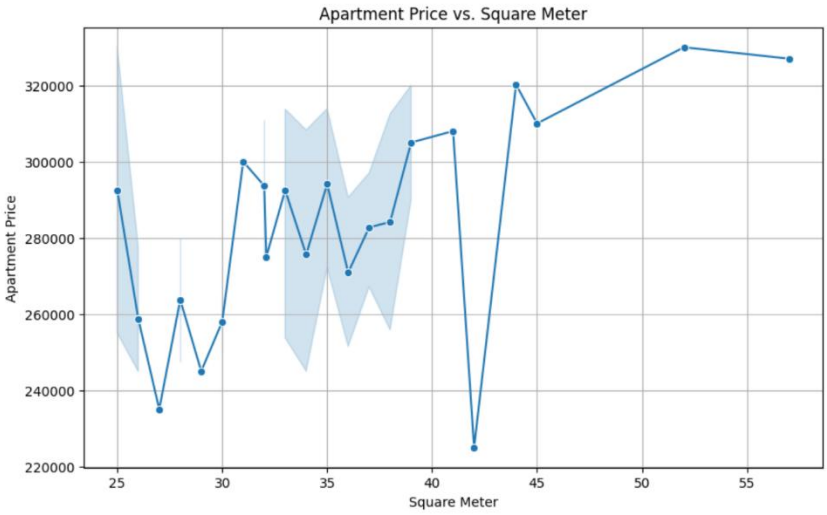
1. **Bar Plot**:

Method: A sns.barplot was used with x='neighborhood' for neighborhoods and y='apt_price' for apartment prices, with hue='neighborhood' to separate data by neighborhood using different colors.



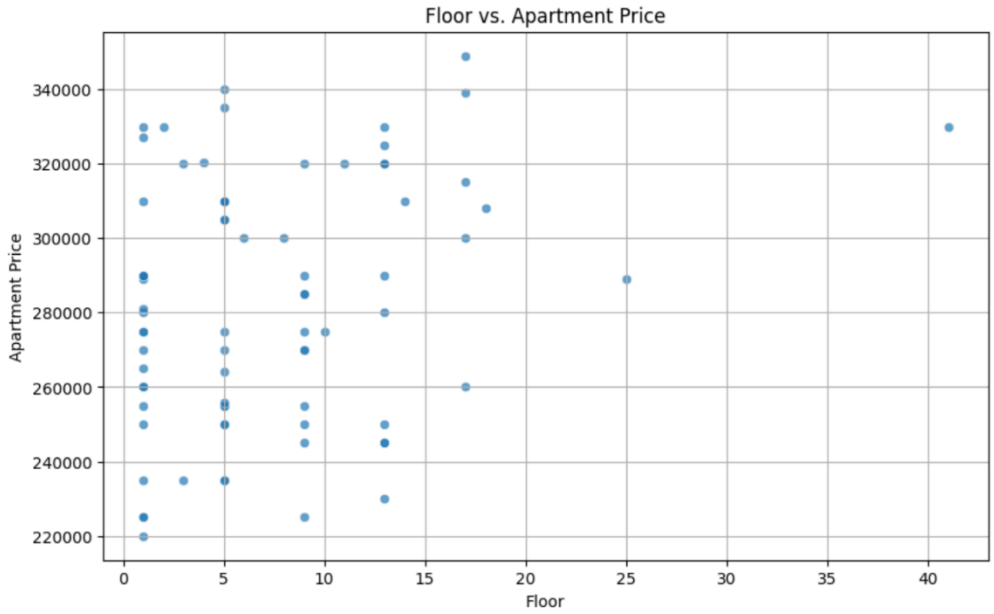
2. **Line Plot**:

Method: A sns.lineplot was created with x='square meter' for area and y='apt_price' for price. Data points are marked using marker='o', and a grid was added for better visualization.



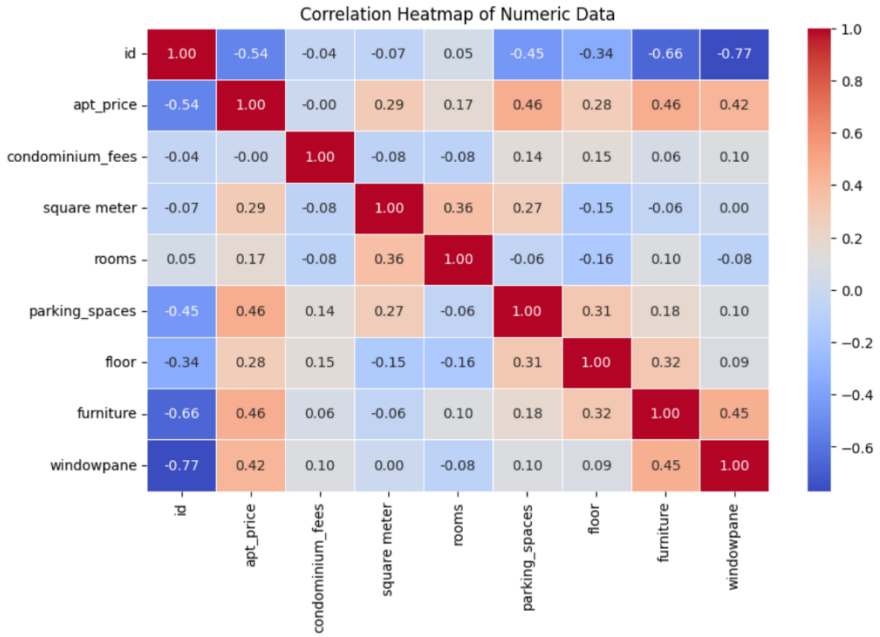
3. **Scatter Plot**:

Method: A sns.scatterplot was used with x='floor' for floor number and y='apt_price' for price. Transparency (alpha=0.6) was applied to make overlapping points clearer.



4. **Heatmap**:

Method: A sns.heatmap was applied to the correlation matrix of numeric data. The matrix was annotated with correlation values, and the color intensity represented the strength of correlation.

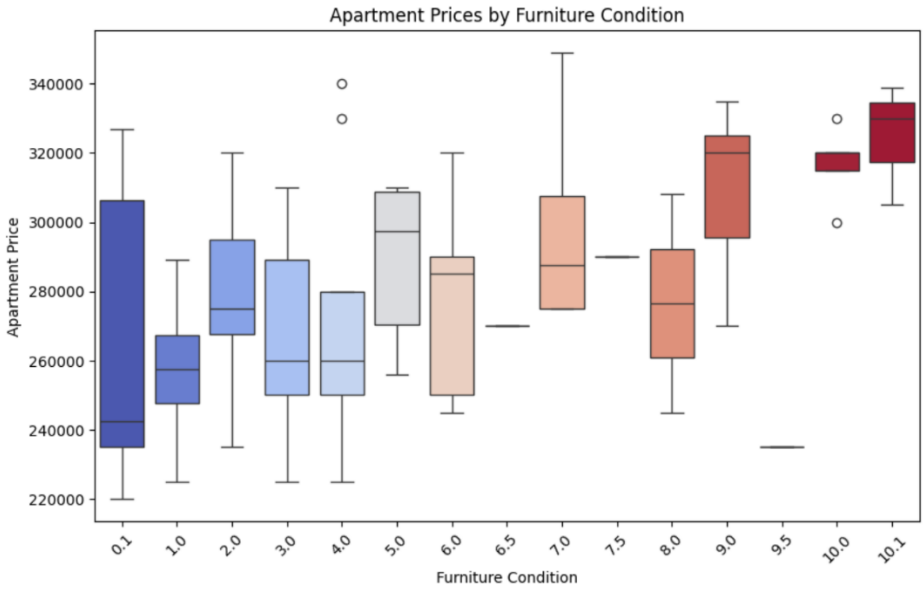


5. **Histogram**:

Method: A sns.histplot was used to plot apartment prices (x='apt_price') with 20 bins, and Kernel Density Estimation (KDE) was included to visualize the distribution more smoothly.

6. **Box Plot**:

Method: A sns.boxplot was used to compare apartment prices (y='apt_price') by furniture condition (x='furniture'). The hue='furniture' parameter distinguished between different furniture conditions.



3. Libraries

- **pandas**: Used for data handling and reading (pd.read_csv).
- **matplotlib**: Used for creating and displaying plots (plt.figure, plt.show).
- **seaborn**: Used for statistical plotting (sns.barplot, sns.lineplot, sns.heatmap, etc.).

4. Results and Insights

1. **Apartment Prices by Neighborhood**: The bar plot showed significant variation in apartment prices across different neighborhoods, with some neighborhoods having much higher prices than others. This insight can guide investors in choosing desirable areas.
2. **Apartment Price vs. Square Meter**: The line plot demonstrated that larger apartments tend to have higher prices, which aligns with expectations and provides insights into how apartment size influences pricing.
3. **Floor vs. Apartment Price**: The scatter plot revealed that higher floors are often priced higher, likely due to better views or greater desirability of higher-level apartments.
4. **Correlation Heatmap**: The heatmap revealed strong positive correlations between apartment size (square meter) and price, confirming that larger apartments generally cost more. This can be used for pricing strategies based on area.
5. **Distribution of Apartment Prices**: The histogram showed that apartment prices are somewhat normally distributed, with a majority of apartments priced within a certain range, providing a clear view of the market's price concentration.
6. **Apartment Prices by Furniture Condition**: The box plot showed that apartments with new furniture tend to have significantly higher prices compared to those with older furniture. This suggests that market demand may be higher for newly furnished apartments.