"E6: Apartment Price Prediction and Analysis"

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Motivation & Goal

Understanding apartment prices and predicting their values is crucial for buyers, sellers, and investors. The project aims to build a predictive model for property prices in Estonia, identify key influencing factors, and detect undervalued properties to aid investment decisions.

Approach & Data

The dataset was scraped from kv.ee, containing 14 key features like location, size, rooms, and condition. Over 11000 listings were scraped in total. Data cleaning and feature engineering addressed missing values, outliers, and inconsistencies. Exploratory analysis highlighted trends such as price variations by location and condition, forming the foundation for the predictive model.

Methods

- Data cleaning and feature engineering for predictive accuracy.
- Exploratory Data Analysis (EDA) to uncover trends and relationships.
- We trained a RandomForestRegressor and a LinearRegression model and evaluated their performance using metrics such as RMSE and R^2. RandomForestRegressor yielded better results.

Results & Visuals

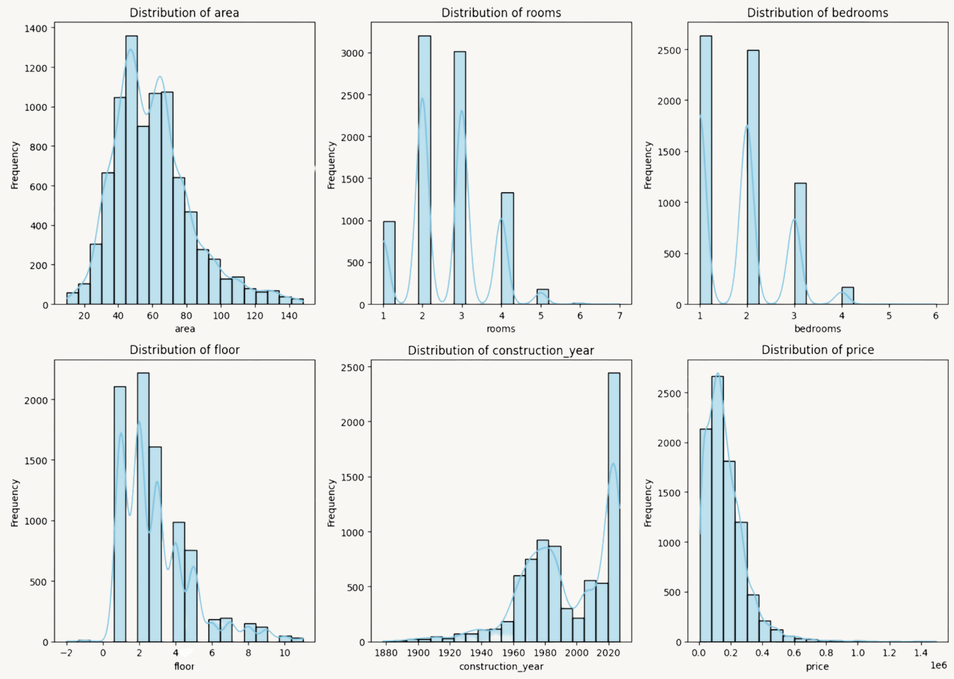
The predictive model achieved high accuracy with a R^2 coefficent of 0.89. Features like location and size identified as the most significant price predictors. Undervalued properties were detected by comparing predicted prices to listed values. Visualizations, including scatterplots and feature importance graphs, confirmed the model's reliability.

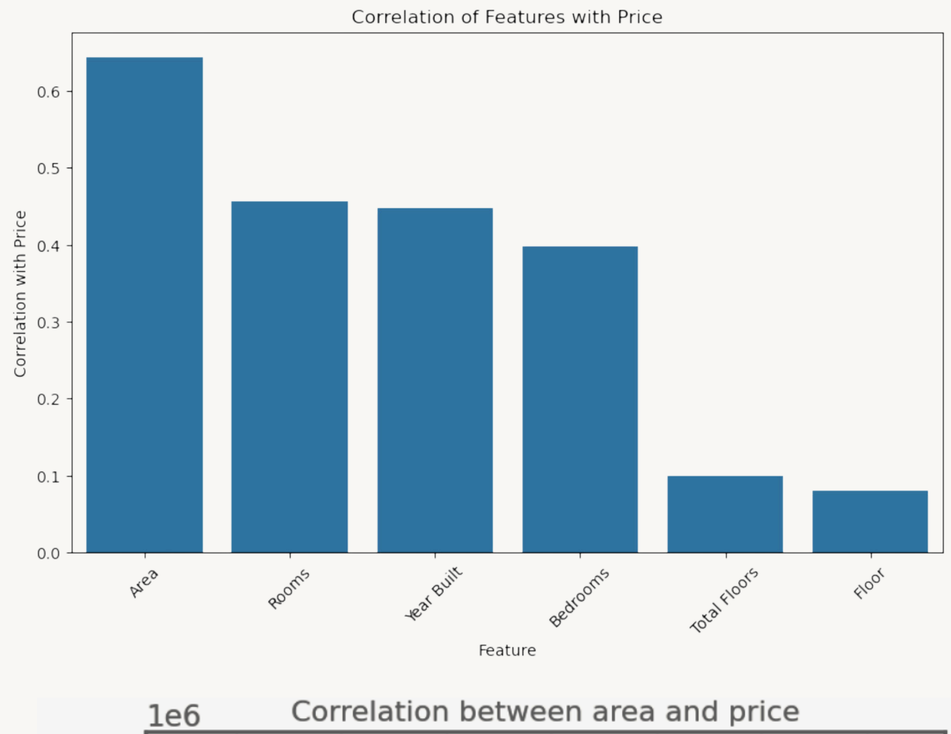
The model tends to overestimate the value of properties priced below €250,000 and underestimate listings exceeding this threshold. Location plays a significant role in determining whether a property is undervalued. Listings in remote or less populated areas typically have lower prices. A key indicator of our model's accuracy is that undervalued listings are often inactive because they have already been purchased. This aligns with market trends, as competitively priced properties tend to sell quickly, supporting the reliability of our predictions.

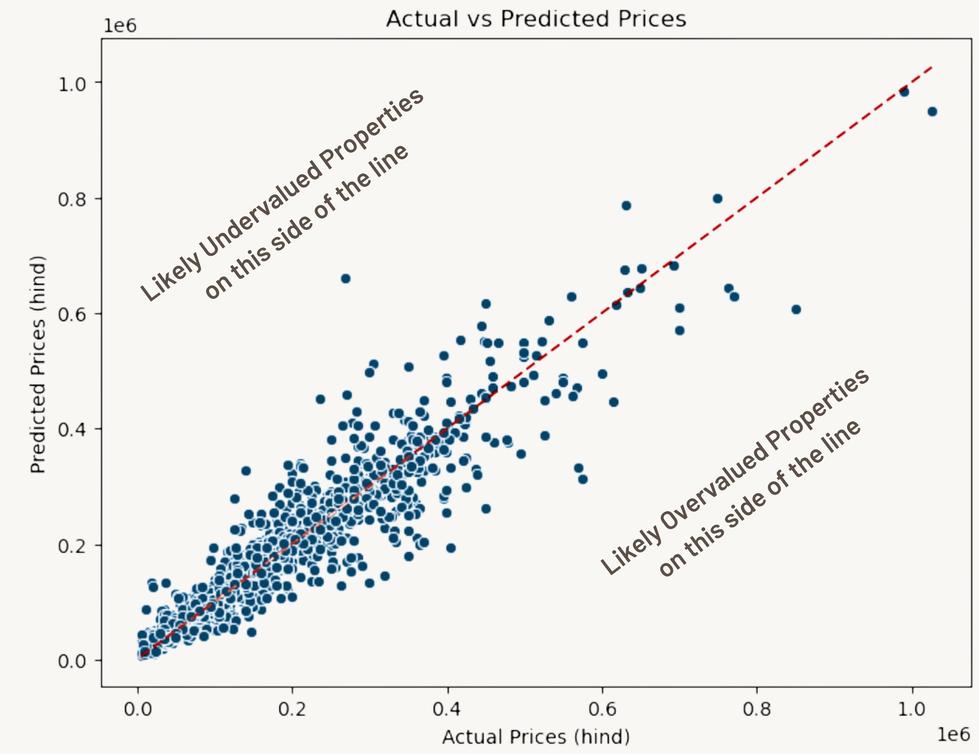
Conclusion

The project successfully predicted apartment prices with actionable insights for investors. Location, size, and the number of rooms were key predictors. Identifying undervalued properties provides potential investment opportunities. These findings could enhance decision-making for buyers and real estate investors.

In future iterations, we aim to incorporate smaller, property-specific features, such as the presence of a sauna, balcony, or parking space. These unique characteristics can significantly impact apartment prices but were not included in the current model. By capturing such details, we hope to enhance the model's granularity and improve its accuracy in reflecting individual property values.







Undervalued properties

Model prediction:	€203,000	€235,000	€281,000
Listing price:	€149,000	€175,000	€194,000