



# AIRBNB PRICE DETERMINANTS



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## Abstract

Airbnb is a worldwide house and property rental platform that provides short-term accommodation services to those who prefer houses to hotels. The platform puts the responsibility of determining the price of the hosts. However, the prices are not determined randomly. In this project, the real data from the official site of Airbnb will be used to determine which attributes are the most decisive ones in determining the price. The model to be developed with this project is to provide an auxiliary service for homeowners to estimate the prices more accurately. In order to work more efficiently within the scope of this project, we are conducting extensive searches and investigations on machine learning, deep learning and data mining, which are the applications of artificial intelligence.

**Key words:** Airbnb, Determining The Price, Machine Learning, Deep Learning, Data Mining, Artificial Intelligence.

## Introduction

In recent years, people prefer to use platforms such as Airbnb, which determines the price according to the characteristics of the place they will stay, instead of fixed and generally high-priced hotels during their touristic trips and holidays. The Airbnb platform does not have a price determinant for homeowners based on the characteristics of their homes. With this project, we have created a platform where homeowners can determine the prices of their homes. The platform sets an appropriate rental price using the properties found in the house. In the past years, multiple price-setting projects have been carried out for hosts using Airbnb. Various machine learning algorithms and models were used in all of these projects. We were able to examine many literature research that could be a reference to our project. According to this literature researches, we examined Regression and Classification models. We used a random forest algorithm for the high performance of the platform.

## Advisor:



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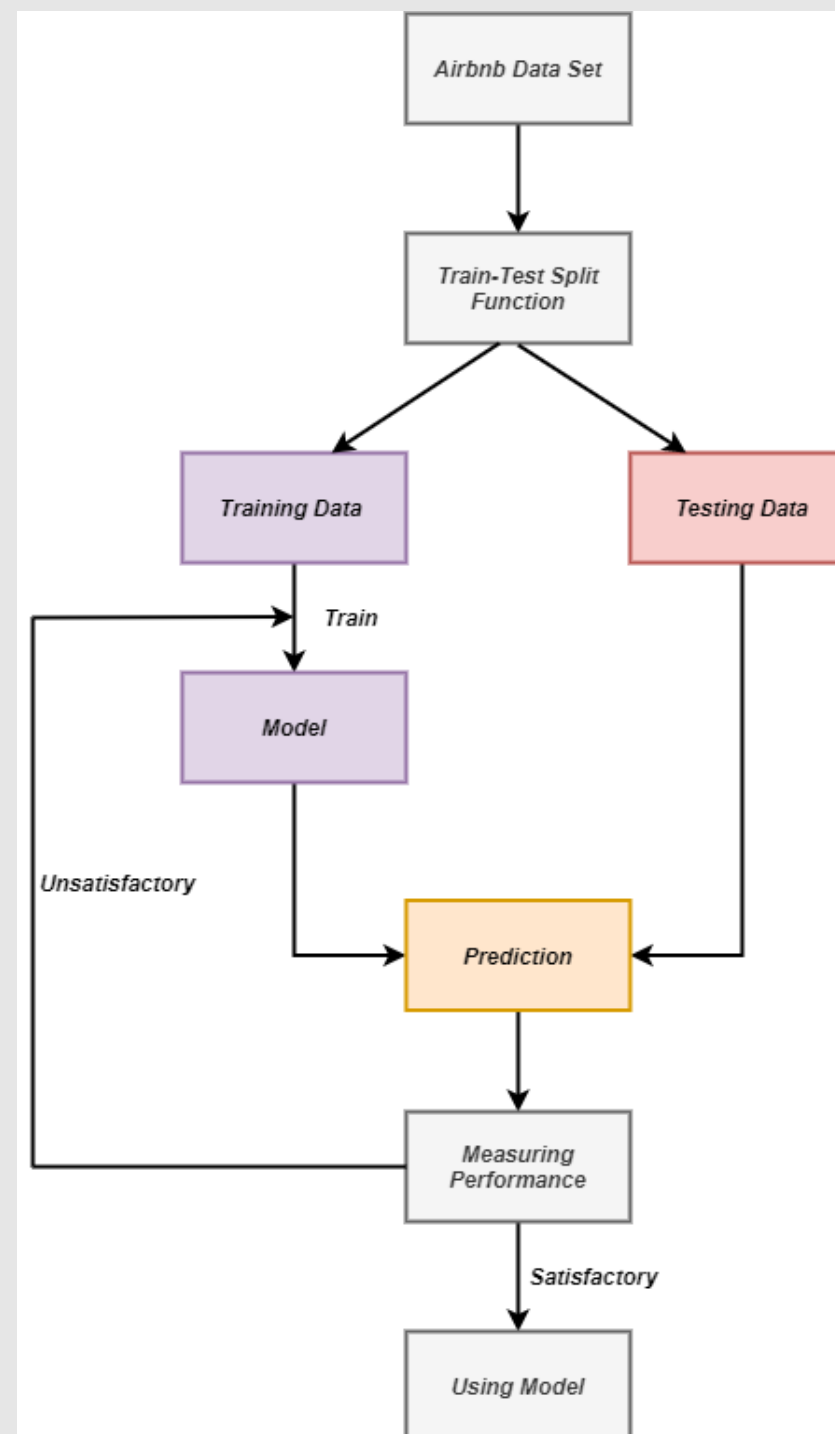
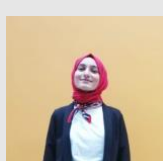
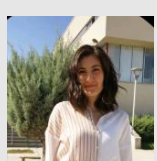
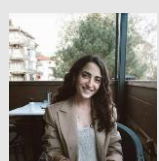
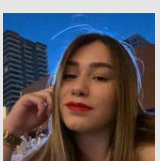


Figure 1- System Flow Diagram

## Solution

This Project have include two main parts which are model training and web. In the model training part, Exploratory data analysis was performed. Then, operations such as dealing with missing data, dropping unnecessary features, dropping completely empty records, and dealing with categorical data required for exploratory data analysis were carried out to become suitable for model training on the Airbnb Istanbul dataset. Random Forest regressor was chosen as the model to be trained. For model training, 25% of the data set is reserved for testing and the rest for training. After the feature selection, house type, room type, number of bathrooms, number of bedrooms, number of beds, and neighborhood were the main features for price prediction. According to the test results, Our model can predict approximately 30 out of 100 data correctly.

In the web part, Flask was used to develop the backend of the website. Beşiktaş which has many data in the dataset was used instead of some neighborhoods which were not in the model to estimate price correctly. Bootstrap was used to develop the frontend of the website.

## Results & Conclusion

As a result, We had the opportunity to examine Airbnb data sets, make sense of the data and use them in models. After choosing the appropriate data set for Airbnb Istanbul, we tried the algorithms and models we will use for price prediction and developed the model that could best predict the data set. While doing all this, we learned to determine the requirements of a real system, design and test it. We developed the random forest regressor machine learning model for best performance in the back-end part of the project and completed the web application with flask in the front-end part.

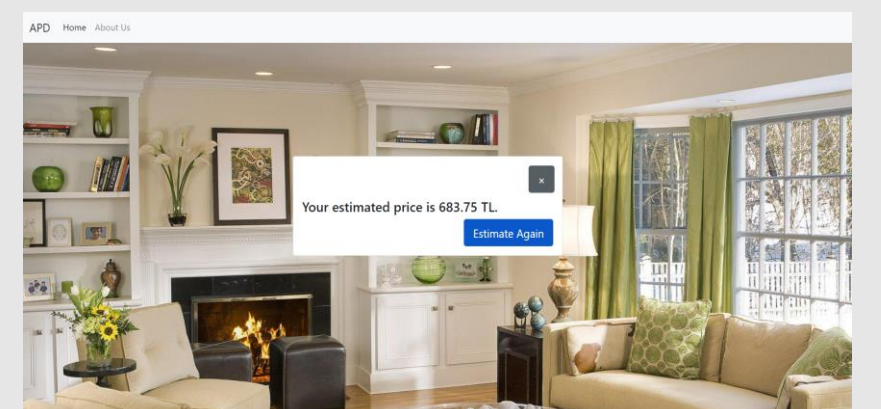
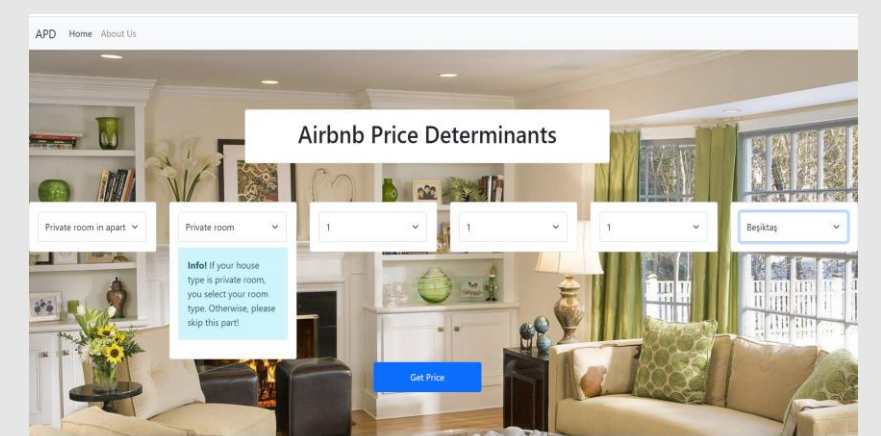
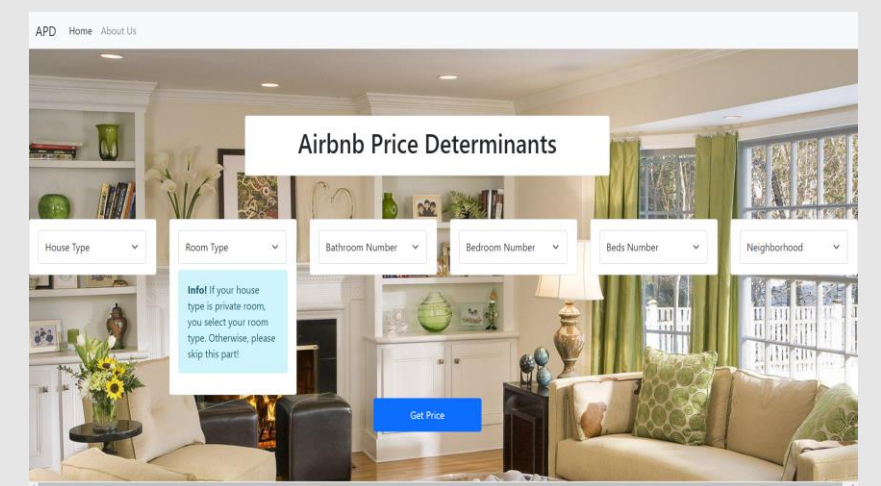


Figure 2- Finished Product

## Acknowledgement

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