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**Software Design Description
Version 1**

CENG 407
Innovative System Design and Development I

202002
AIRBNB PRICE DETERMINANTS

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1. Introduction

This Software Design Description (SDD) document contains detailed information about how the software of the project should be created and the design plan. In this context, the Software Design Description document will be supported with graphical models, diagrams and architectures with necessary explanations.

1.1 Purpose

The purpose of the Software Design Description document is to make the explanations of the steps to design the software required for a system and the details such as what will be built and how to design these steps.

1.2 Scope

The scope of the Software Design Description document is system oriented. It allows the information and documents required for this system to be gathered, edited and changed when necessary. In short, it helps to create the basics of the software to be developed before the system becomes a product with explanations and visuals.

1.3 Definitions, Abbreviations, Acronyms

SDD	Software Design Description
SRS	Software Requirements Specification
Host	People sharing their home on the Airbnb Platform

1.4 Overview

The overview of the Software Design Description document will be as follows: introduction, design explanations, necessary software and hardware architectures, interfaces and designs.

2. Design Considerations

This section contains the terms and concepts required for design in the context of Software Design Description. Accordingly, this part of the document contains approaches, tools, assumptions, dependencies and restrictions.

2.1 Approach

Our basic approach is to show in detail the patterns, structural styles, frame templates required for design.

2.2 Tools Used

The data required for this web platform will be extracted from Airbnb's official site. This data will be processed with Python. Anaconda source will be used for this. In addition, PHP will be used for the web part and MSSQL will be used for the database.

2.3 Constraints

The restrictions for the system are as follows:

There are two types of users. One of them, the host, will use this platform for price estimation and Admin is the person who develops and manages the platform. Housing types are entire house, entire apartment or just one room. If there is only one room, it should be stated that this room will be shared or non-shared. There are also restrictions on the features that determine the price. These features are selected as follows:

Selecting number of bathrooms and bedrooms. In addition, the remaining features will be determined by the algorithm to be used according to the data later.

2.4 Assumptions and Dependencies

There is no need for a special login to use the platform. Users with basic software and hardware requirements can access and use this platform.

3. Architecture

3.1 Software Architecture

Airbnb Price Determinants platform has a data-based software architecture. Thanks to this database, users can take advantage of the platform and access the value corresponding to the price up to date. The representation of the software architecture is as follows:

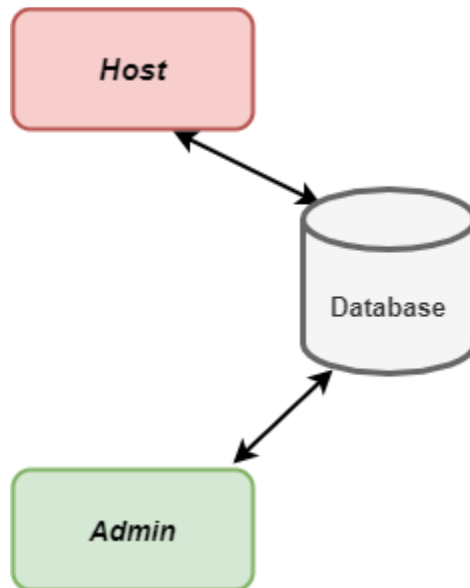


Figure 1: Software Architecture of Platform

3.2 Hardware Architecture

A user layer, a server layer and a database layer will be needed for this platform because users need a user layer to access the platform, while a server layer is required to use the platform. Also, a database will be required to keep the platform up to date.

In short, although there is no restriction in the user-side, the access to the server-side is limited to the admin type user.

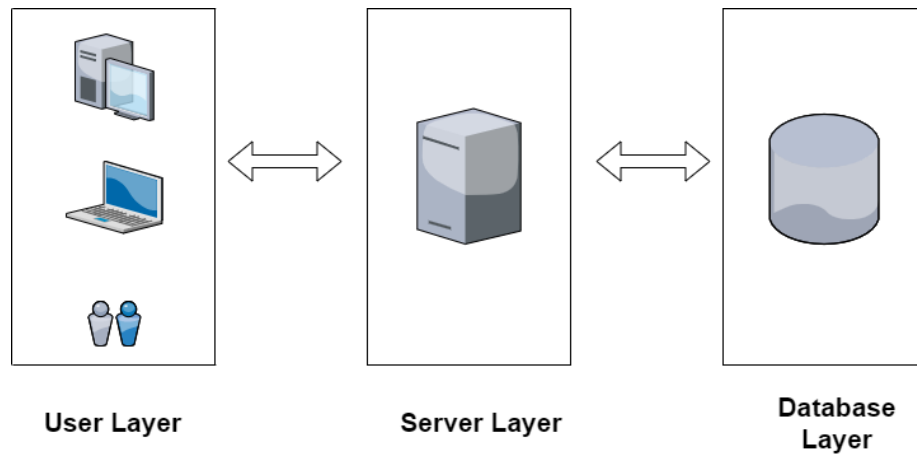


Figure 2: Hardware Architecture of Platform

4. System Interfaces

4.1 Software Interfaces

There is no need for a specially defined operating system for the computer to use this platform.

4.2 Hardware Interfaces

There is no need for a specially defined system to run this platform. This platform can be easily run on any computer with basic requirements.

5. User Interface Design

The interface perspective provides a visual design of the product to be created for designers, programmers and testers and provides a better understanding. The interface design presented in this part of the document is designed in accordance with the use cases and scenarios in the SRS document.

5.1 Home Page

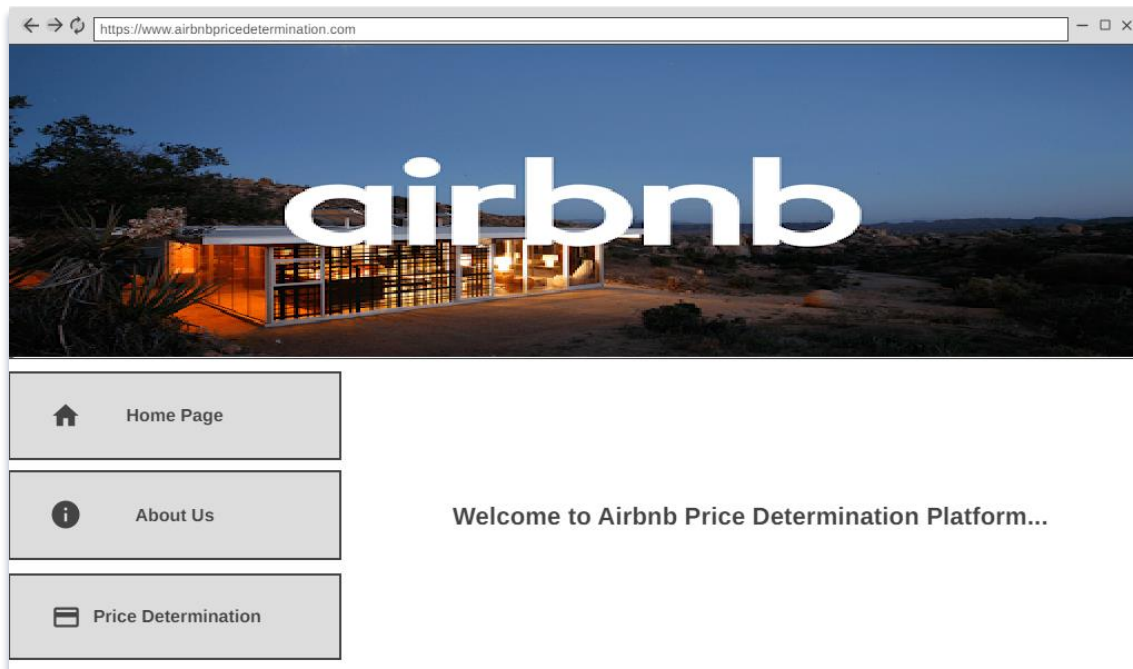


Figure 3: Home Page

5.2 About Us Page

When the Airbnb Price Determination platform is opened, this page is accessed when the *About Us* button is clicked on the main page.

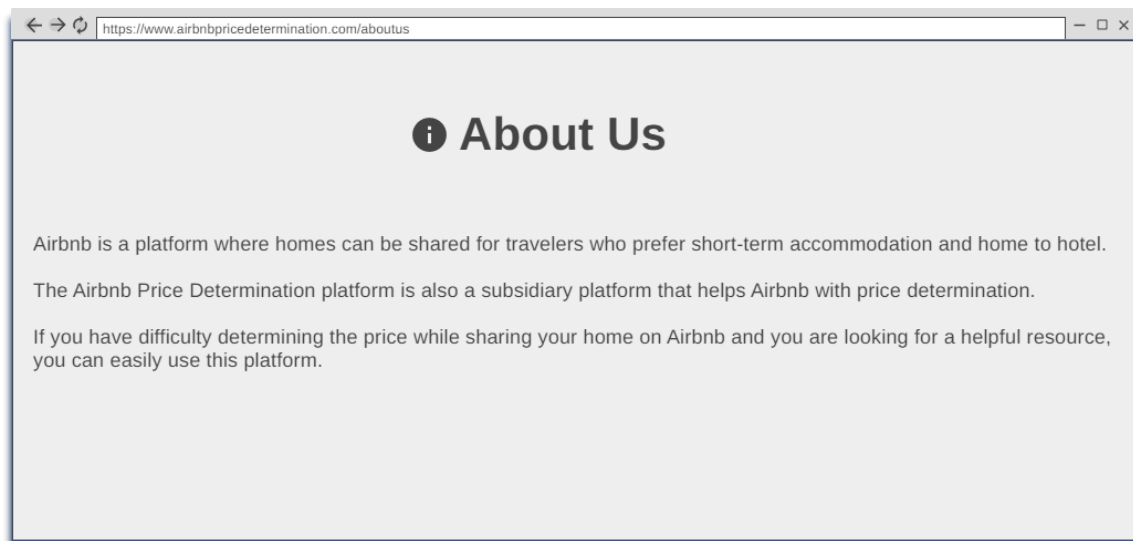


Figure 4: About Us Page

5.3 Price Determination Page

When the Airbnb Price Determination platform is opened, this page is accessed when the *Price Determination* button on the main page is clicked.

On this page, there are features that will determine the price. The user must fill in these features according to the property to be placed on Airbnb. Features such as house type, room type, neighborhood, number of bathrooms and bedrooms are general price determination criteria for Airbnb. However, there will be additions according to the features that will appear as a result of the model to be used in the section specified as extra features.

The screenshot shows a web browser window with the URL <https://www.airbnbpricedetermination.com/pricedetermination>. The page title is "Price Determination". The form contains four main sections:

- House Type:** A dropdown menu with options: Entire House, Entire Apartment, Room (selected), Shared, and Private.
- Neighborhood:** A list of neighborhoods with checkboxes: Beyoglu, Kadiköy, and Fatih. There are three vertical dots below the list.
- Bathrooms:** A list of bathroom counts with checkboxes: 1, 2, and 3. There are three vertical dots below the list.
- Bedrooms:** A list of bedroom counts with checkboxes: 1, 2, and 3. There are three vertical dots below the list.

At the bottom of the form, there is a horizontal scrollbar.

Figure 5: Price Determination Page

The screenshot shows a web browser window with the URL <https://www.airbnbpricedetermination.com/pricedetermination>. The page is titled "Price Determination" and features four main input sections: "Neighborhood", "Bathrooms", "Bedrooms", and "Extra Features". Each section has a dropdown menu and a list of options with checkboxes. The "Neighborhood" section lists "Beyoglu", "Kadiköy", and "Fatih". The "Bathrooms" and "Bedrooms" sections list "1", "2", and "3". The "Extra Features" section has a vertical ellipsis icon. A "See Price" button is located at the bottom right of the form.

Figure 6: Price Determination Page

5.4 Estimated Price

After the features on the Price Determination page are filled, the estimated price value will appear on this page by clicking the *See Price* button.

This screenshot shows the same "Price Determination" page as Figure 6, but with an "Estimated Price" modal box displayed in the center. The modal box has a title bar with a close button (X) and the text "Estimated Price". The background form is slightly dimmed, and the "See Price" button is visible at the bottom right.

Figure7: See The Price

6. Process Design

6.1 Use Cases

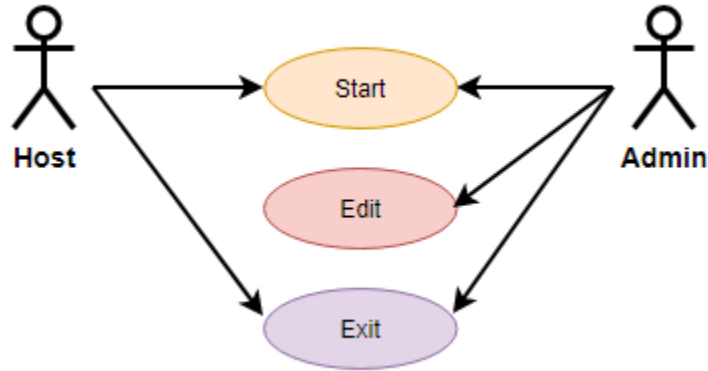


Figure 8: Profile Management Use Case

Admin: This type of user can develop and manage the platform.

Host: This type of user is people who share their homes on the Airbnb platform. Meanly, he/she is the owner.

Table 1: Actions for Admin User Type

Actor	Action	
Admin	Start	Indicates access to the platform
	Edit	It is the act of performing operations such as the database of the platform and interface design
	Exit	Indicates leaving the platform

Table 2: Actions for Host User Type

Actor	Action	
Host	Start	Indicates access to the platform
	Exit	Indicates leaving the platform

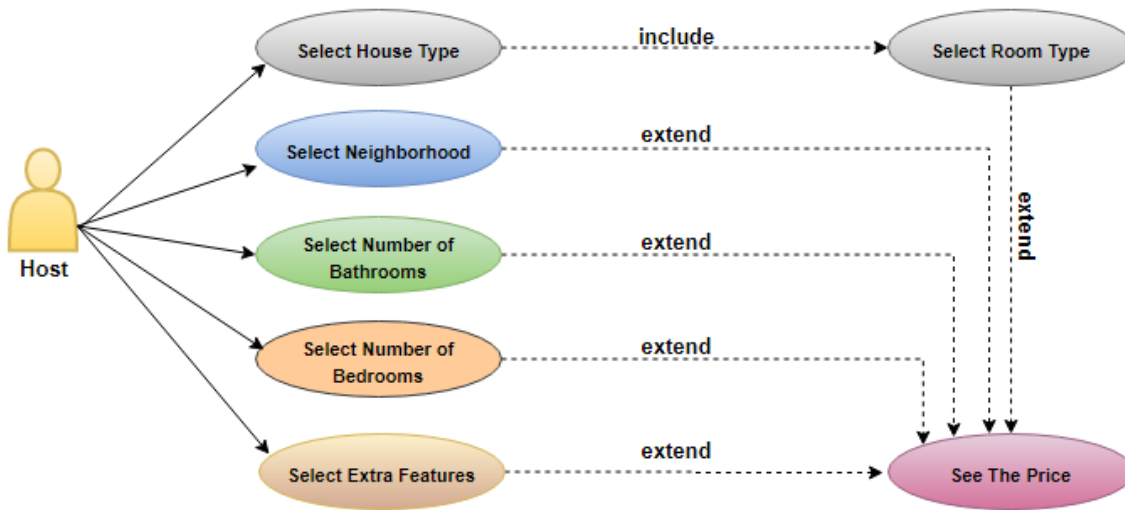


Figure 9: Host Use Case

Table 3: Explanation of Host Use Case

Actor	Action	
Host	Select House Type	There are two types of house types, entire house and entire apartment
	Select Room Type	There are two types of room types, shared and private.
	Select Neighborhood	It specifies the selection from the list of neighborhood according to the location of Airbnb
	Select Number of Bathrooms	Indicates the selection of the number of bathrooms in house types
	Select Number of Bedrooms	Indicates the selection of the number of bedrooms in house types
	Select Extra Features	It is the selection of the criteria of the price determination features to be added according to the result of the model developed according to the data.

6.2 Sequence Diagram

In this section, the actions that the host user can do are specified using the diagram. Accordingly, the host must first access the platform, then open the price determination page on the platform and select the features in the appropriate way. Finally, when you click the see price button, it should be able to access the estimated price.

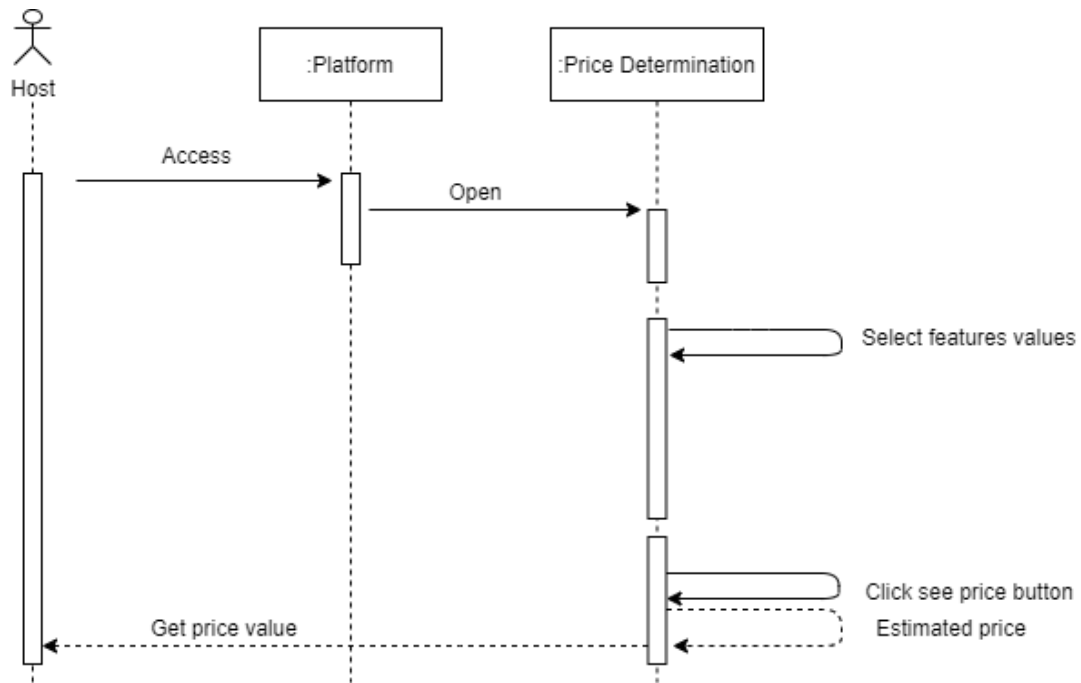


Figure 10: Sequence Diagram of Airbnb Price Determination Platform

7. Database Design

7.1 ER Diagram

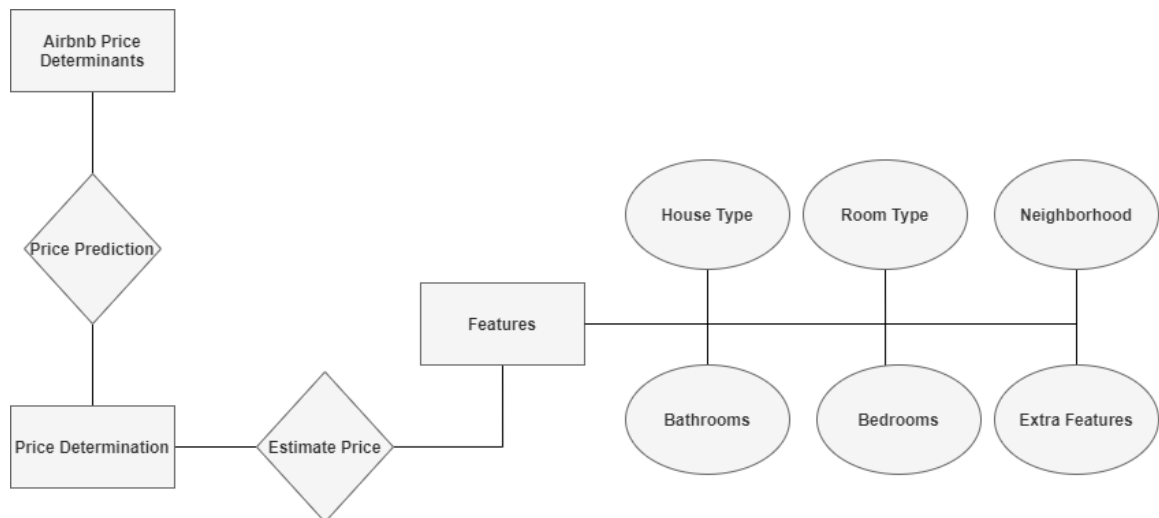


Figure 11 : ER Diagram

8. References

- [1] IEEE Recommended Practice for Software Design Descriptions.
- [2] IEEE Recommended Practice for Software Requirements Specifications.
- [3] <https://wireframe.cc>