HACETTEPE UNIVERSITY DEPARTMANT OF COMPUTER SCIENCE

BBM-104 PROJECT ASSIGNMENT 2: SMART HOME SYSTEM

GÖKDENİZ ŞİMŞEK - 2210356067

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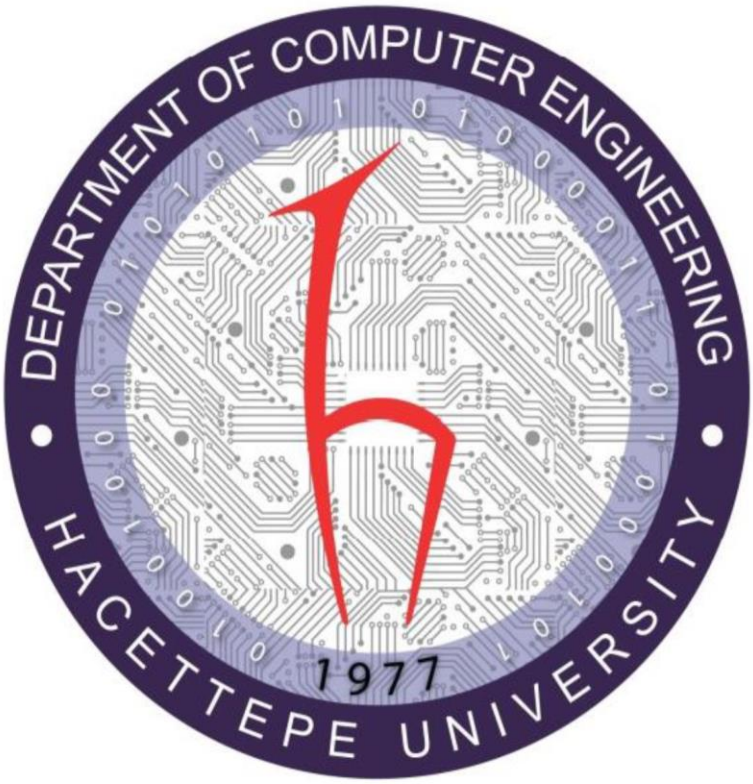

1. Defining the Problem

The purpose of this assignment is to set up a multi-purpose smart home system. It is to create a system of devices with some special features. Considering the various features of these devices and their exception errors, methods should be created according to the specified commands. It is designed for people's convenience and living comfort. In this system, coding principles such as Inheritance, Polymorphism, Abstraction, Encapsulation should be used. The user should be able to easily control this system. According to people, all the features of the system that need to be created and the wrong moves that can be made should be taken into consideration.

2.Explaining the Solution Approach

In order to create a Smart Home System, what needs to be done first should be considered. The best option is to create the necessary Smart Device classes first. The features required for the devices should be determined. (For example, brightness, kelvin degree for SmartLamp, etc.) A SuperClass should be created that includes the common features of these devices for simplicity and brevity. Afterwards, devices must be created in their own classes. Some methods must be created for editable properties. Each device has different features as well as similar features. (For example, the changeName method, the Switch method, etc.) Time class is something that should be on every device. It is always necessary to follow the time and change the instantaneous time when necessary. After the device and time classes are determined, the input file entered by the user should be evaluated. After following the appropriate steps, each line should be evaluated step by step. Each line of the input file contains different commands to be executed. It is necessary to understand and correctly apply the command that is intended to be done by handling the lines appropriately. There are commands that concern a single device, as well as commands that concern all devices. These commands, which are made at the request of the user, include commands to inform the user (ZReport method) and to perform future actions (setSwitchTime method). While doing these, the user should be informed at every step. Errors received and actions taken should be printed into an output file.

3.The Problems Which I Faced and the Solutions

One of the troublesome parts of installing the Smart Home system is checking that the functions drawn from the input file are applied correctly. All faulty transactions that may occur in this regard should be eliminated. These errors need to be found by experimenting if necessary and by thinking if necessary. Methods affecting all Device Classes are as difficult as debugging. Care must be taken when creating and implementing these methods. The outputs of the errors taken according to the data entered in the input should also be printed to the output file, and the user should be informed. The most problematic issue is the implementation of the setSwitchTime method. For this method, for which a forward-looking change is determined, both the states of the devices and the instantaneous time should be evaluated.

4.Benefits of This System

The purpose of this system is to improve people's comfort and quality of life. Users can control their home via the Smart Device system whenever and wherever they want. It is very easy for people to control devices. However, users need to make the correct entries for commands. In addition, it creates a safer situation for users as they can access all information about the house.

5.Benefits of OOP System

An object-oriented programming (OOP) approach was used to create the computer language Java. In the realm of programming, OOP is a popular methodology that is supported by numerous computer languages. Making the code more modular and reusable, which makes maintenance simpler and speeds up the development process, is one of the most important advantages of OOP. OOP also improves readability and comprehension of the code because each object or class performs a distinct function that is defined independently. Additionally, it facilitates debugging and increases the dependability of the product. The principles of OOP are adopted by many programming languages, including Java, making OOP a core idea in contemporary programming. OOP also enables multiple programming functionalities and allows for the design of more complex systems.

6.UML Diagrams