Project Report

® Project Name: Digital Home

® CSE 2100: Software Development Project-I

Under supervision of

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1. *Introduction:*

It is very common for us to keep the lights, fans, air-cooler etc. turn ON when we leave our home. When we come back we get noticed about this deed of us which increase the bill of our electricity and also it is a waste in national electricity system. But unfortunately we cannot give up this bad habit. So here comes our project “Digital Home” to help people to have a control on his home from anywhere through internet.

2. *Objective:*

- To help user get noticed about his house`s current condition is the purpose of “Digital Home”.
- To minimize the waste of time to control all the features of the house which are operated by electricity, in a single place through computer.
- To reduce the misuse of electricity and others electrical materials such as bulb, fan, air cooler, freeze, television etc.
- Finally to make the world fast is the main objective of this project.

3. The Deployments:

This application is developed as a 2nd year 1st semester software development project, a course titled *"Software Development Project-I"*. As a requisite we used the Java programming language to develop the application. The development environment used was "*Eclipse JUNO"*.

● *Why use java?*

Java is Object Oriented Programming language that contains very rich API, specifically designed towards faster and more efficient application development. The API is a large collection of ready-made software components that provide many useful capabilities. It is grouped into libraries of related classes and interfaces; these libraries are known as *packages*. As a platform-independent environment, although the Java platform can be a bit slower than native code, its powerful API is the primary reason for it to be used to develop this application, as in many others being developed by a large number of developers around the globe. Moreover, advances in compiler and virtual machine technologies are bringing performance of Java applications close to that of native code without threatening portability.

● *About Eclipse*

The Integrated Development Environment (IDE) most favored by many Java application developers is *"Eclipse".* It is also the IDE endorsed by Oracle Corporation, the organization including its GUI Design feature that brings down the overhead of GUI designing to a minimum.

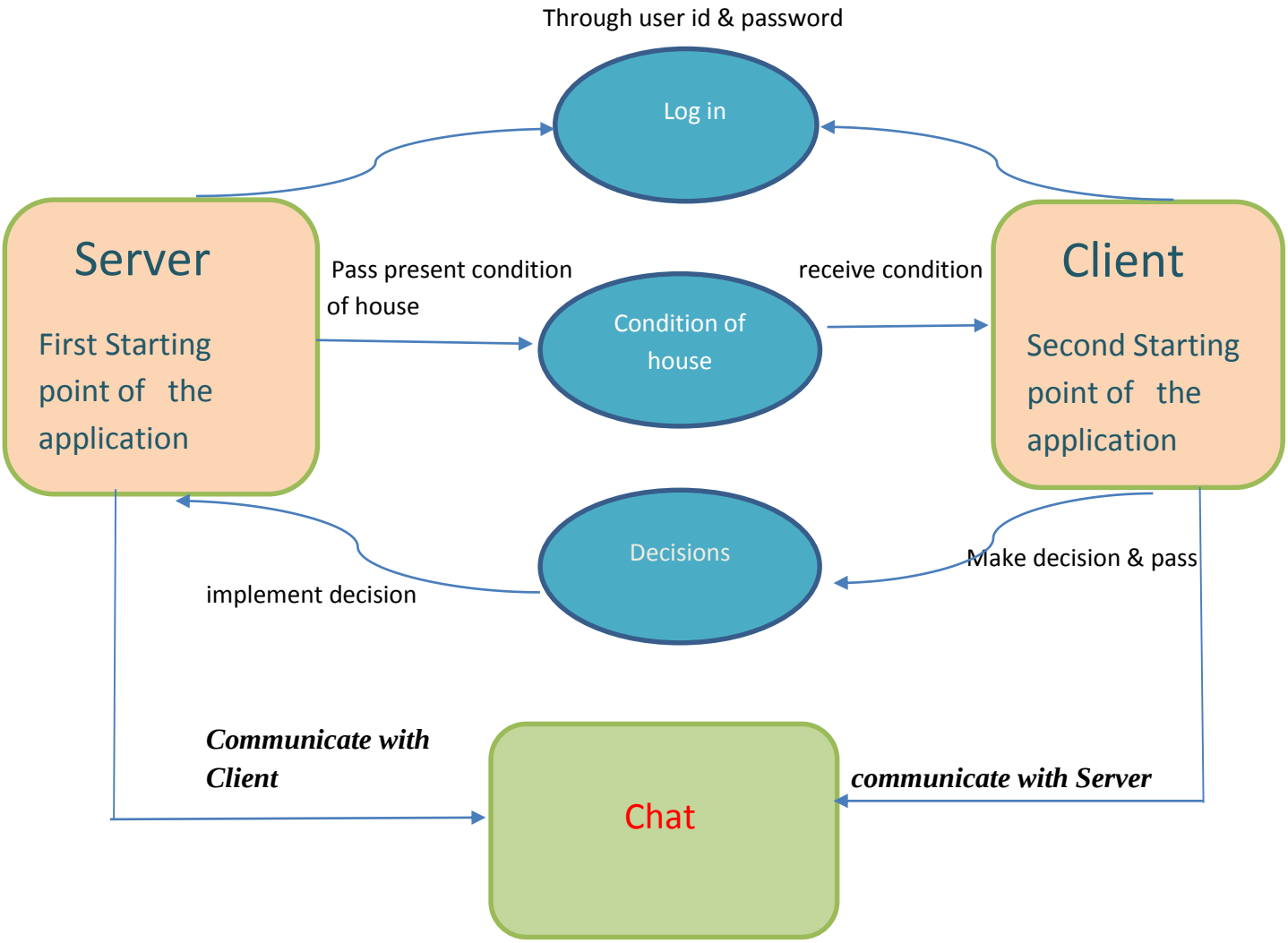
4. Project Structure:

The project is constructed in only one package named ‘default package’ and it contains several classes and these are shown below:

Package Name	Including Class Names
Default Package	MainClient
	MainServer
	MovingCarClassInClient
	MovingCarClassInServer
	MovingClassInClient
	MovingClassInServer
	PanelBackground

Table 1: Package and classes in the project

5. *Control Flow in the Project:*



6. How "Digital Home" works:

A brief discussion on how this application works and what is the functionality of its classes are given below:

- ***Code Sample:***

In our project there are one package and eight classes which are in interrelationship.

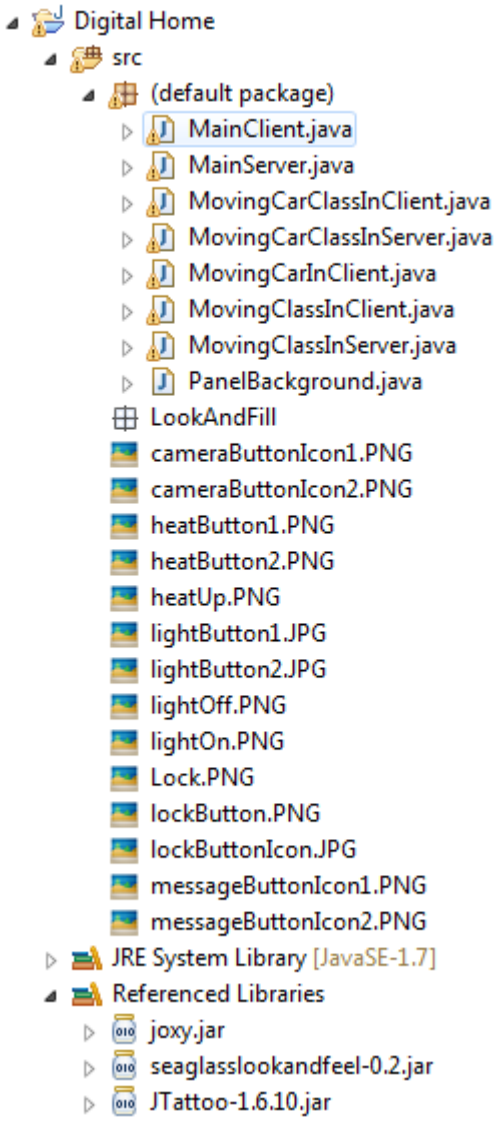


Fig: package and classes

The classes MainServer and MainClient are the main working class of this application. The other classes are used to create a user friendly Graphical User Interface (GUI). Some lookandfeel function have been added to enhance the beauty of the application. The main window of the client class is shown below

Fig: login window of Client

After login with correct user id and password the user will get into the application and will see the window below

Fig: Main window

When a user is at the main widow shown above, then he could take any decision such as he could turn off the light if it were turned on or he could unlock or lock the door of his house.

The figure below is a panel contained of buttons which speak of themselves.

Fig: Buttons to select an operation

These buttons help user to select an operation. Suppose the first button named Lock launch the operation to unlock/lock the door of the user's house. By clicking this button user will get a window which contains the necessary command to complete the operation. The operation under the Lock button is shown through figure below:

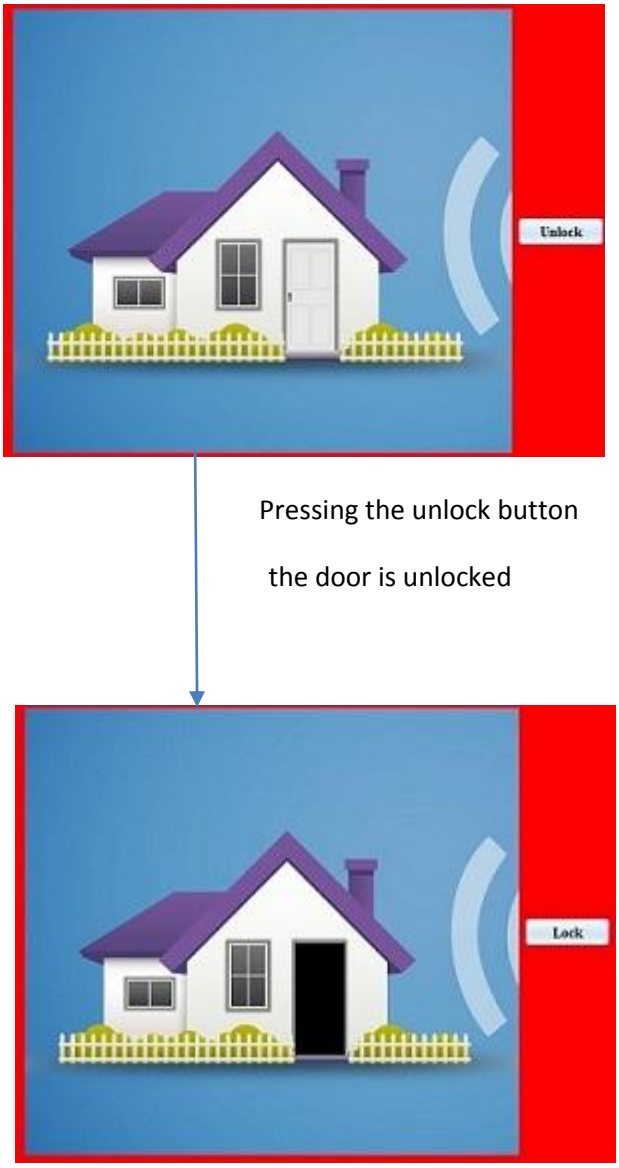


Fig: Door unlock-lock operation

Then a user can select another operation from the button panel. If user wants to turn on/turn of his house's lights he has to select the button named Smart Plugs. This button will take the user to another window which contains necessary command to complete the light turn on/ turn off operation**.**

Fig**:** Smart plugs button

The window and the commands under this button are shown below through figures

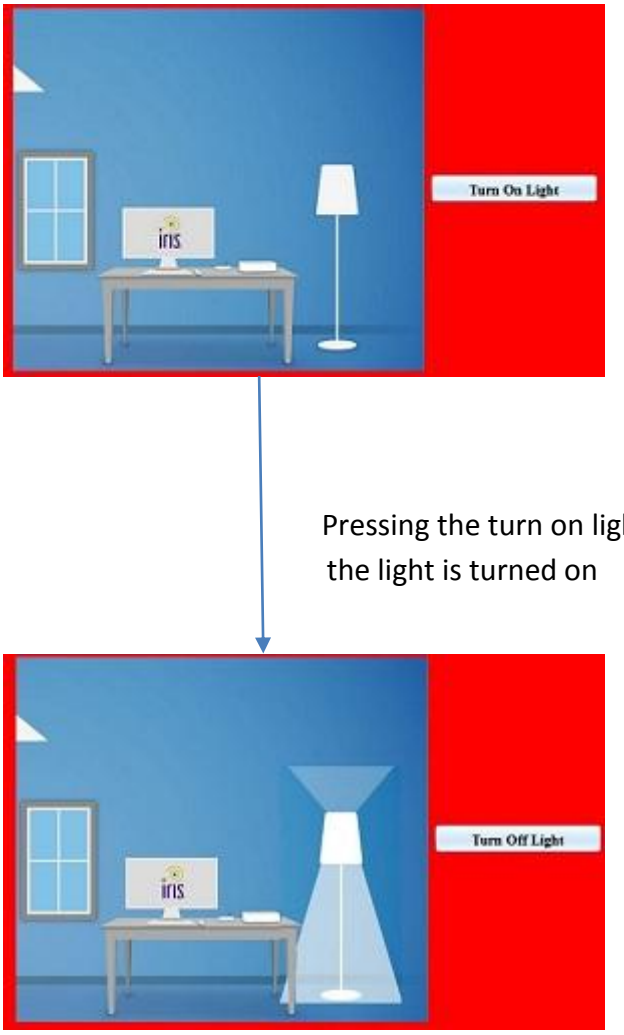


Fig: Light turn on/off operation

Similarly the other button named Thermostat increase/decrease the temperature of the house. The button Camera works as a closed circuit (CC) camera and the button Message sends message if anyone comes to house.

7. Features and usefulness:

The purpose of the application was to enable users to keep a control over their house when they are away of it. The application Digital Home does just that. The usefulness rendered by this application is described in brief below.

1. *"*Digital Home" makes a user free from tension of his house while he is away from it. This application shows him the current condition of his house.

2. When a user of this application get noticed about the current condition of his house then he can change the condition of his house. This is the main feature of "Digital Home" application. As for example, if anyone leaves his house by keeping the light turn ON, he could turn it OFF by using this application sitting in his office or anywhere just with an internet connection. Moreover he will automatically get noticed if anyone come to his house.

3. To use this application user only needs a device with internet connection and enabled with the application. So this application has no limit of place.

4. This application can also be used between to computers using LAN and Bluetooth connection.

5. Another extra feature of this application is that a user can chat with any person at his house if he wishes to. So this application keeps a user connected with his house.

8. Limitations:

As no single program can fulfil all requirements, our application, ”Digital Home” hence, has some shortcomings. These shortcomings are discussed below:

This application can be used by only one user at the same time. Because of not implementing multithreading the server cannot get connected with several users/clients at a same time. Besides this projects is only a software simulation. No hardware part is implemented. The hardware part is mainly used to practically implement this application. But our project was only a software development project.

9. Improvement

The following improvements could be made to the application against the limitations stated above:

1. This application can be improved to such a level so that multiusers can use it at a same time.
2. It is a desktop application. Its smart phone version can be developed.
3. Finally this application has a wide range of hardware implementations.

10. Conclusion:

Digital Home as an application does what it is supposed and meant to do. Although, user range of this application is quite small, those who need to have an application that does digitalizes their home for them as easily and efficiently as Digital Home does, this application, we hope, will be of great value.

11. Reference:

- ✓ The Java SE 7 Documentation by Oracle Corporation
- ✓ The Java Tutorial by Oracle Corporation
- ✓ Java – How to Program, 7th Edition, Paul Deitel & Harvey Deitel

Acknowledgment

A word of special thanks must go to our highly esteemed teacher and this project's supervisor, Prof. Dr. MMA Hashem, Department of computer Science & Engineering, KUET, for his excellent advices and right directions without which our project may not have reached a state it is in now.

Any constructive comments, suggestions, criticism from teachers as well as seniors will be highly appreciated and gratefully acknowledged