TRC-FURAP-6 Funded Project: 2018-2019

Smart Home Automation System for Elderly and Handicapped People Using Mobile Phone

MINISTRY OF MANPOWER

NIZWA COLLEGE OF TECHNOLOGY

IT-DEPARTMENT

A PROJECT REPORT

Submitted by:

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ABSTRACT

Smart Home Automation System for Elderly, and Handicapped People using Mobile Phone is a mobile web based application. The aim of this project is to propose a mobile device based remote control that permits elderly with physical challenges, in particular, aged and handicapped people, to command their desired devices without moving to the nearest control point [1]. At the same time, the local control is not excluded but alternative additional controls are achieved using a remote control supported by Raspberry pi 3 processor.

The smart home automation system is a recent Internet of Things (IoT) based terminology but it is far away from people's usage. In fact, the maximum of home electronic devices are automated but the interconnection of these technologies, the inter-corporation of automated various appliances in a reasonable design, and the ease of deployment due to different communication provides comfortable and convenient. These systems are manageable, low-power consumption, secured, efficient, flexible, scalable and cost saving. In addition, it is showcase from other project by comfortable accessibility and supported by easy-to-use with familiar interfaces.

This project is a dwelling IoT that connects the home electrical devices and services allowing them to be remotely managed, monitored or accessed.

The scope of this project is to helps, the elderly and handicapped peoples to live with peaceful and individual confidentiality.

Introduction:

The project "Smart Home Automation System for Elderly and Handicapped People Using Mobile Phone" by using application in mobile phone. The purpose of the project is to implement the concept of Internet of Things (IOT) to help the elderly and handicapped people to use smartphone without any effort. The home appliaciences connected with smartphone by using Raspberry Pi 3.

Also, created web pages and database to control Raspberry Pi 3 in online server. The online database server used to store the status of the home electronic devices such as Lights, Night Lamps and Fan.

The project is executed by different phases. First phase, the researchers learnt the requirement of elderly, and handicapped people. In the second phase, discussed and the data collected from health doctors to refine the requirements. This project is useful to the elderly and handicapped peoples to improve their life style with ease of usages of home electronic devices.

Project Significance and Objectives:

- To provide comfortable and improving the quality of life style to elderly and handicapped peoples.
- To develop an interface between the remote control with mobile phone and home appliances.
- Each device, in order to accomplish this interface design process using the Raspberry Pi 3 for controlling devices in the home by using smart phone.
- To maintain RF wireless communication between the remote control and the master control panel board.
- To improve the research activities in home automation system.

Methodology

- **Analyzing the requirements of the project:** Primary and secondary data will be collected from internet, Health Doctors, Hospitals, elderly and handicapped peoples that will help to understand the advantages and disadvantages of the existing controlling system in home appliances.
- **Design the architecture:** Develops the architecture to establish the control system to manage the home appliances.
- **Designing of the communication model:** Create a communication model and store in internet based remote server to access the devices from long distances.
- **Circuit diagram on breadboard and configure the program using Raspberry Pi3 kit:** Develop a architecture using Raspberry Pi 3 Model B, Micro SD card, HDMI - TV or Monitor and Smart Phone.
- **Database Access:** To access the applications using database in online server and use the user account in online server.
- **Testing and troubleshooting the functionality of project:** To verify the functionalities of the system and implementation in the real time devices.
- **Documentation:** The project is documented in standard format as well as creating a model or poster to explain the system to the elderly and handicapped peoples to use the devices properly.

Logical Design:

Logic design is a Basic circuit model of a project to develop the project in a right way. It is used to implement the physical devices in a circuit board or components connectivity.

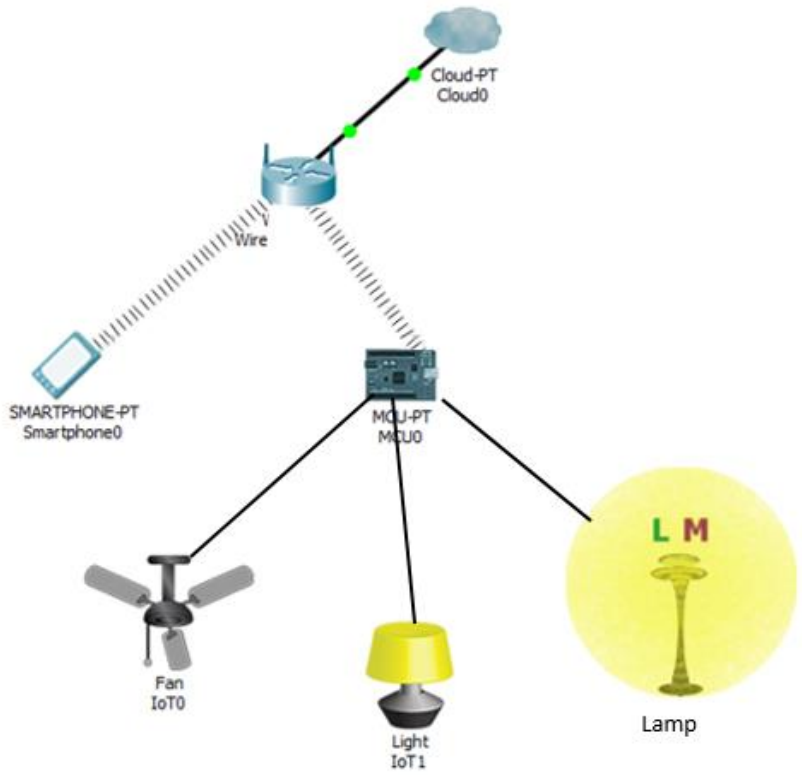


Fig. 1: Logical Design of the home appliances connectivity

Physical Design:

The physical diagram is used to create the initial architecture of the project. This diagram is helping to the project developer to implement the project with real devices.

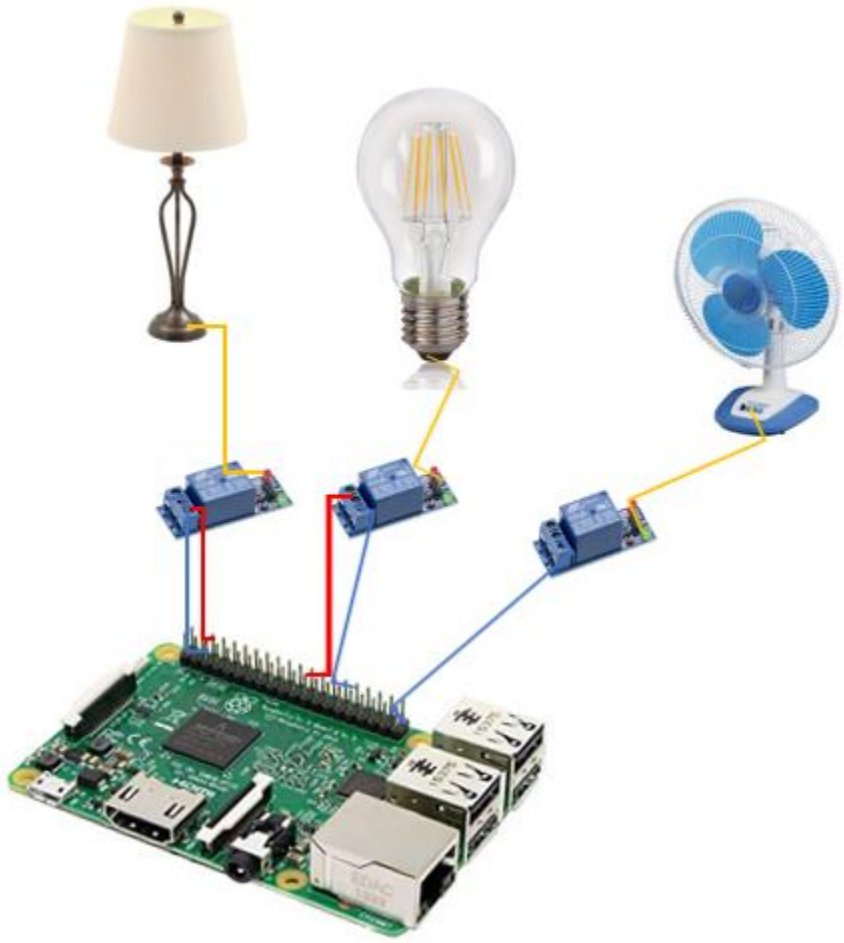


Fig.2: Physical Design of the Raspberry kit connectivity to the home appliances

Components used in the project:

Raspberry Pi: Raspberry Pi 3 kit used in this project. This kit provides the way to connect the components and execution.

Micro SD card: To contain the working framework, it is suggested in any event 8GB or more.

Micro USB 5 volt power source: Normally a cellphone charger or digital book charger, giving a power supply yield of in any event 5V.

USB mouse: any standard mouse.

USB console cable: any standard console cable.

TV or screen: any HDMI/DVI screen or TV should work, however for best outcomes utilize one with HDMI input.

HDMI link: to interface with a TV/screen.

Ethernet link: for wired web association, except if you utilize the implicit Wi-Fi connector to interface with a switch remotely.

IMPLEMENTATION

System interface:

This part is using to interact the programs with Raspberry kit for execution process. The software installation and management is handling by the system interface.

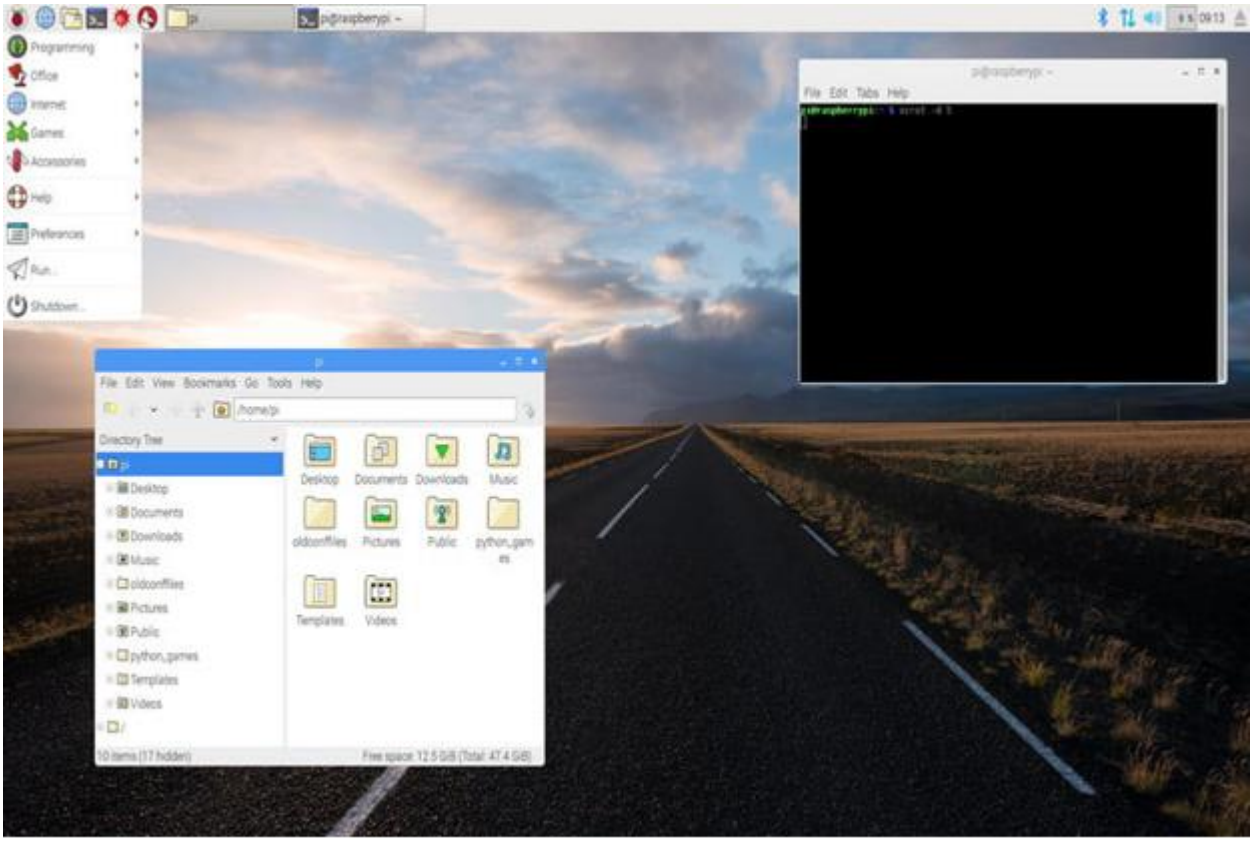


Fig.3: Screen shot of the system

The programming code in Raspberry Pi 3

The software Python is used to develop the programming part. This phase is used to control the power supply between frame relay and the home appliances. Then, completed the program in python language to connect with the Raspberry pi 3 physical configuration in electronic circuit and connected smartphone.

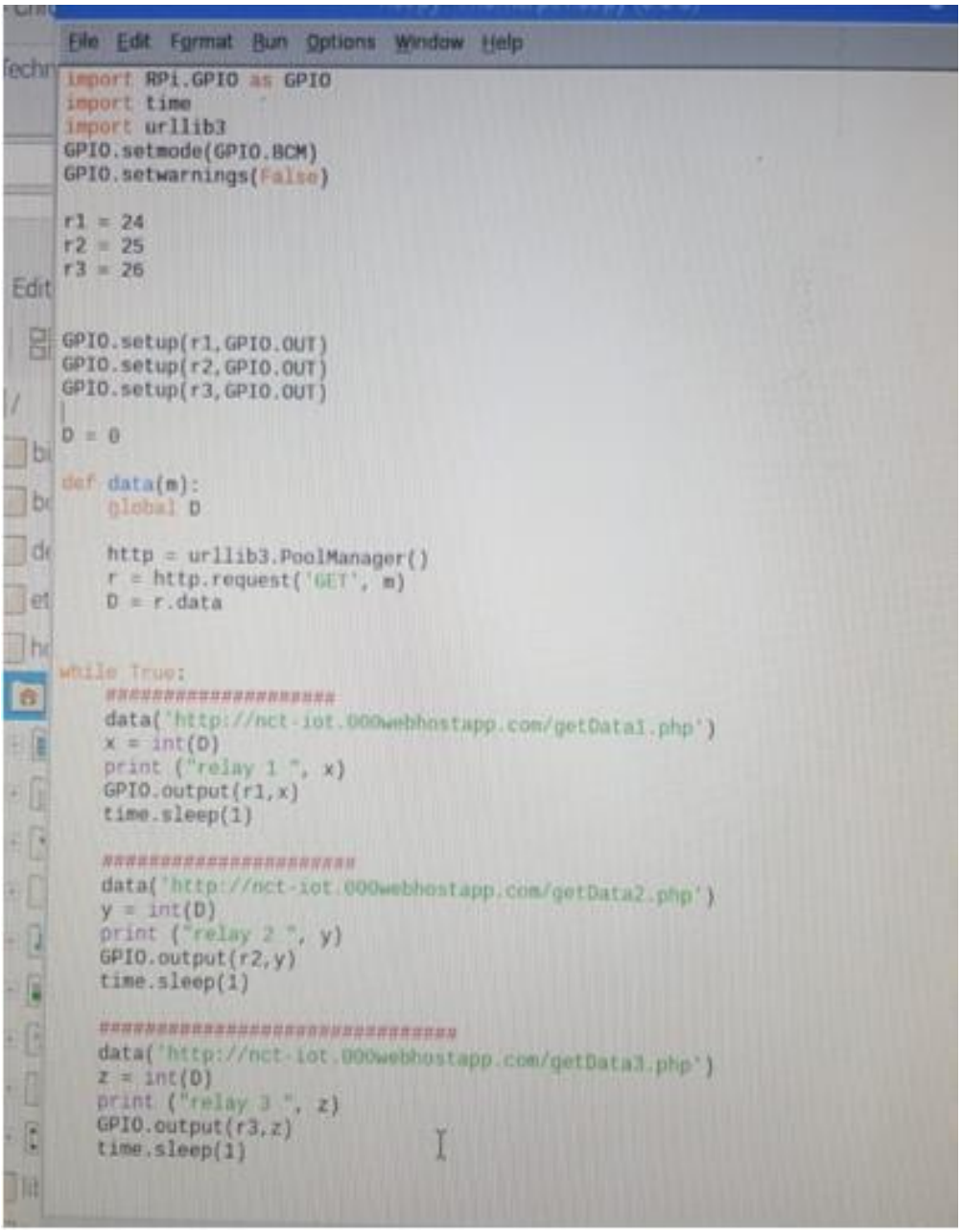


Fig.5: Relay Control Program using Python

Mobile Phone and Home Appliances Control

We used the app inventor web site to create application to control all devices. Registered the username and password

User Name: project2019iot@gmail.com

Password: **********

The mobile controlling system application is as follows

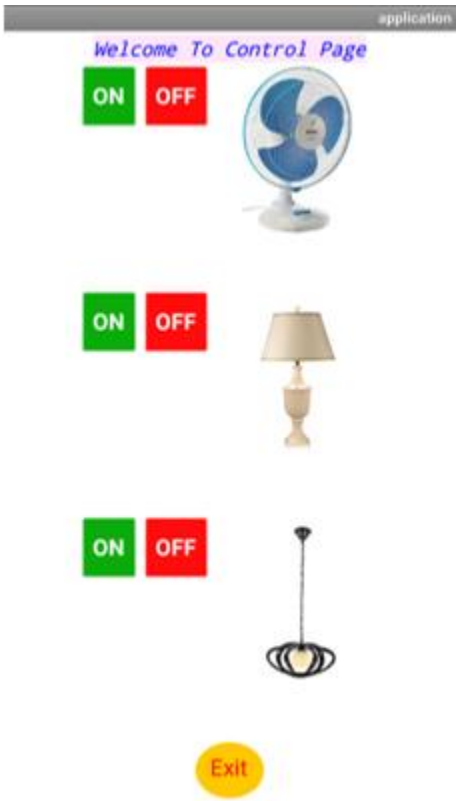
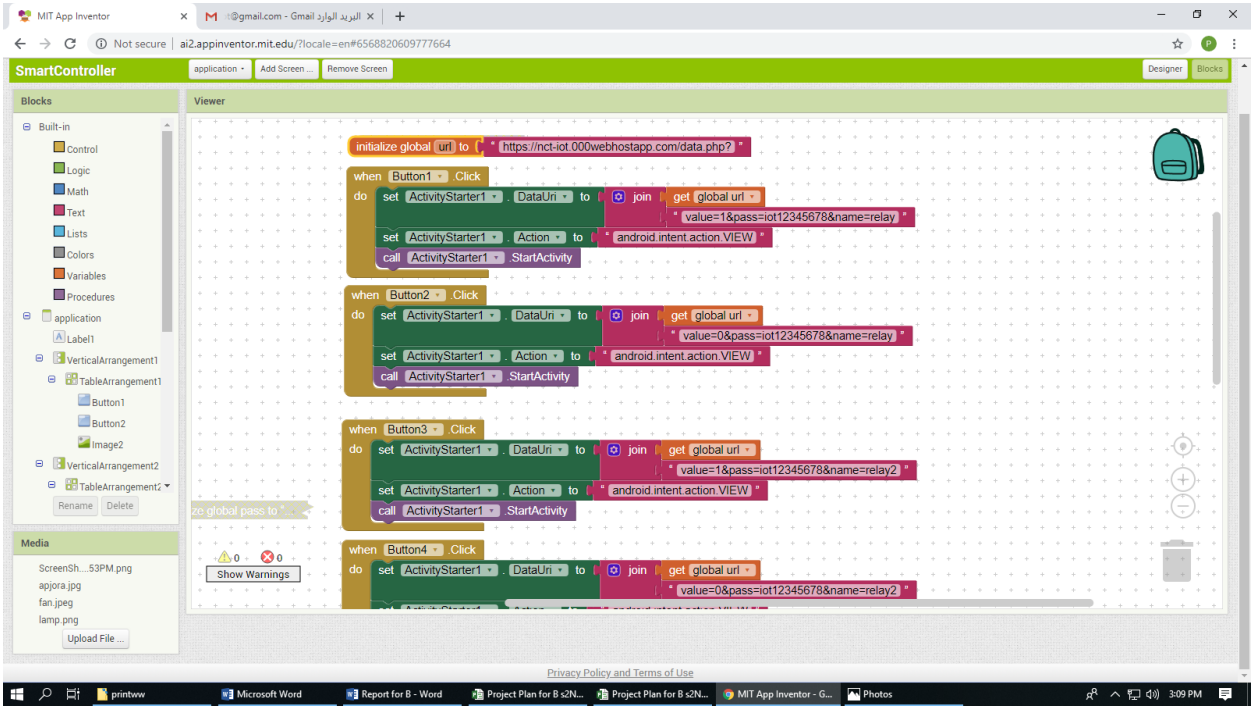
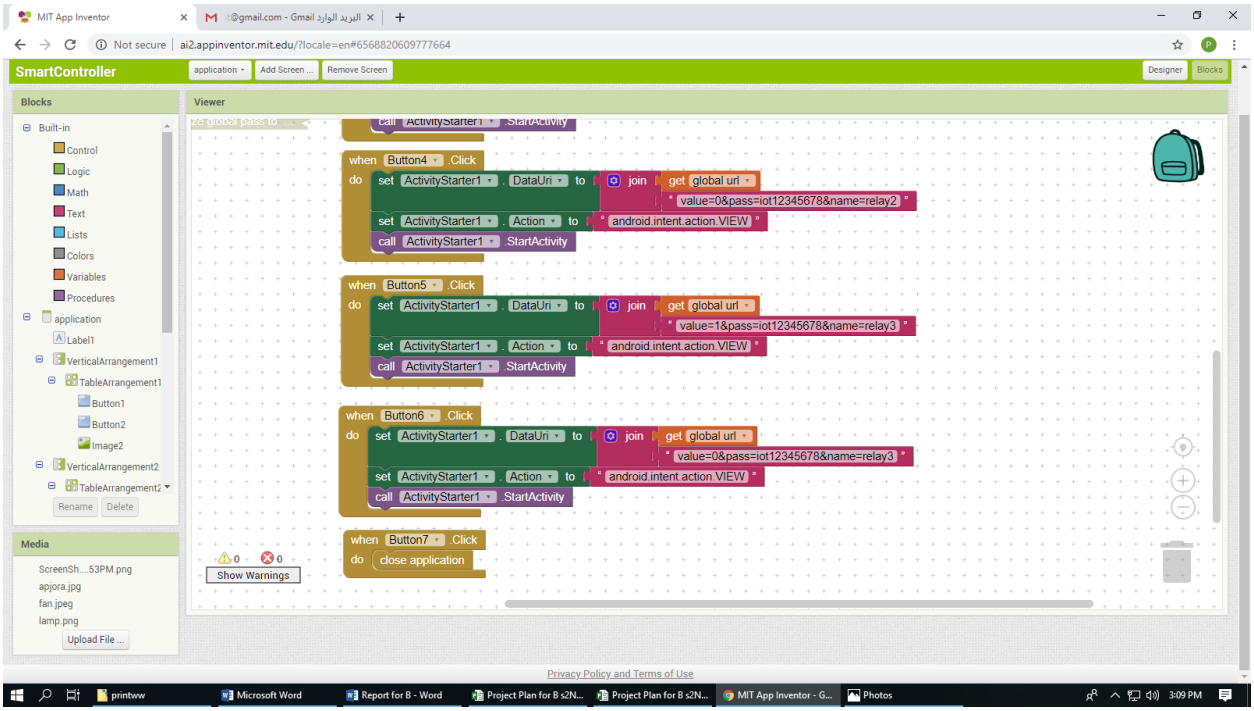


Fig.6: Mobile phone screen layout to control the devices

The program to create control application:





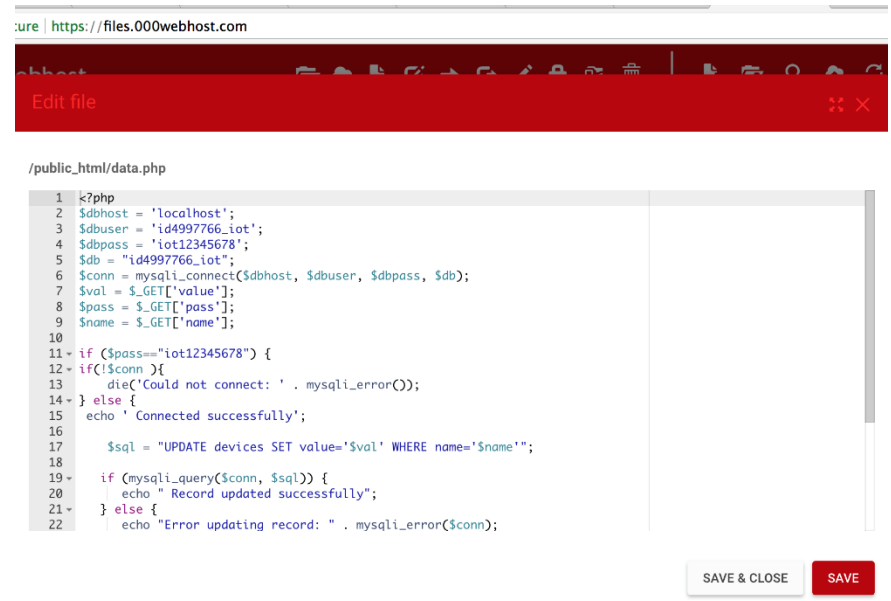
We create online server in webhost web site.

User name:2018myproject2018@gmail.com

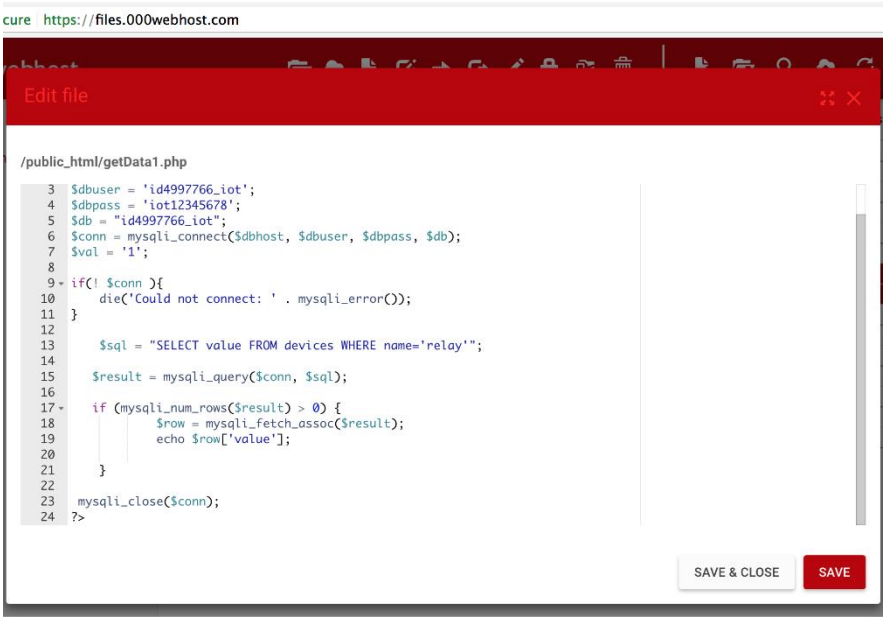
Password: *********

Data. php page is main page to connect to all relay to raspberry pi3.

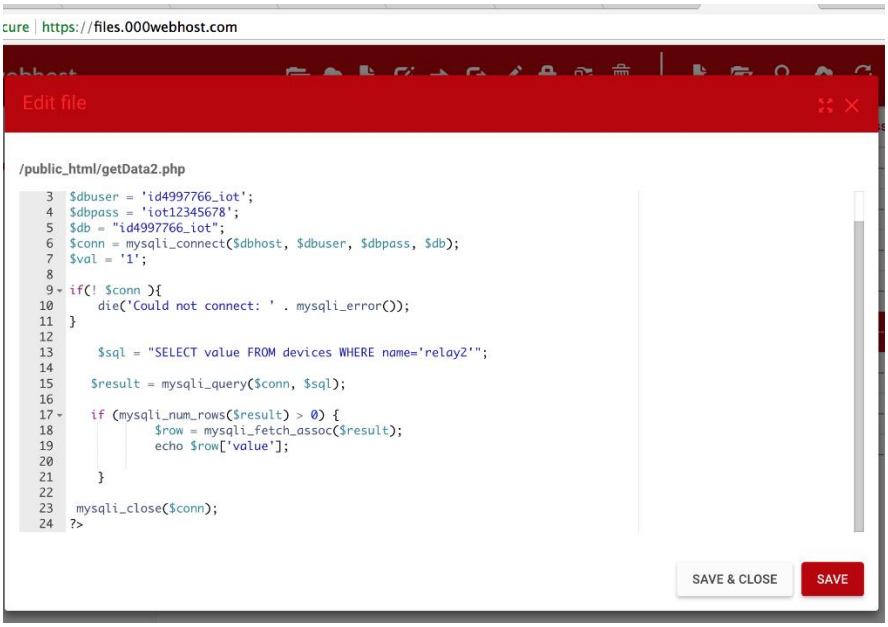
Where relay 1 connected to fan, relay 2 connected to table lamp and relay 3 connected to lamp.

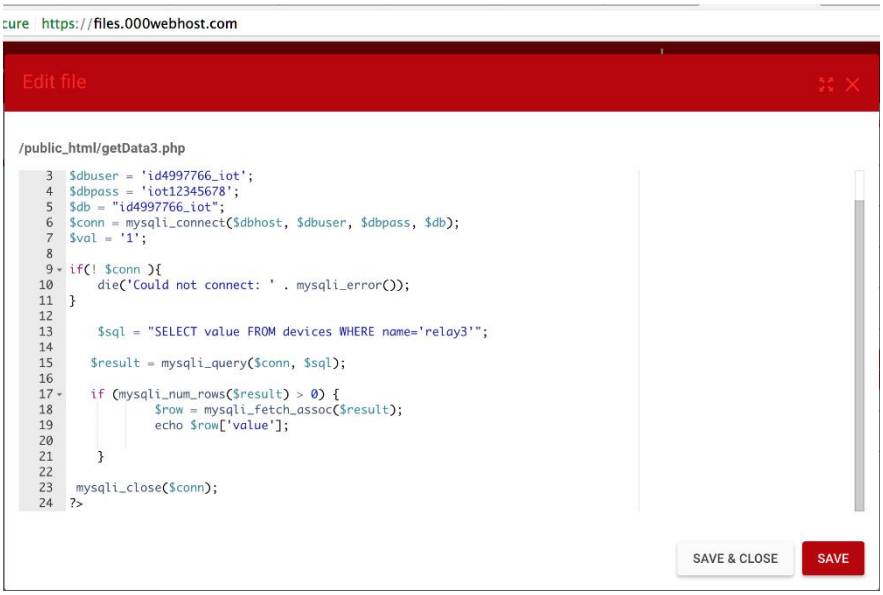


The Raspberry use these page getData.php to get the data from relay 1 (0s or 1s). Where zero means OFF and one means ON.



- getData2.php to get the data for relay 2.





- getData3.php to get the data for relay 3.

Implementation Result:

Before Execution of the Project:

Fig.7: Before Execution of the project

After Execution of the Project:

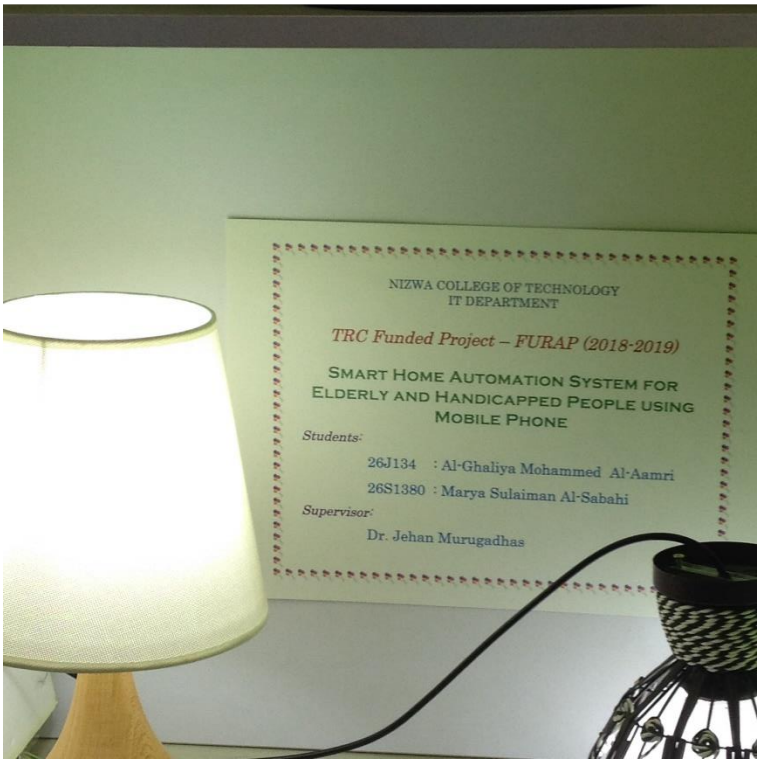


Fig. 8: Working status of the project

Conclusion

Smart Home Automation System is successfully implemented in real time home appliances such as fan, light and night lamp. This project demonstrated to Elderly, and Handicapped People and they felt very happy to use the home appliances through Mobile Phone. In addition, the project helps to elderly and physical challenged peoples to command their desired devices without moving around to the nearest control point.

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