IoT Based Home Appliances Automation System.



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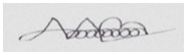
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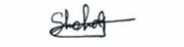
Declaration

It is declared hereby that this thesis paper or any part of it has not been submitted to anywhere else for the award of any degree.



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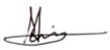
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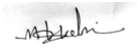
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Certification

This is to certify that this project entitled " **IOT Based Home Appliances Automation System**" is done by the following students under my direct supervision. This project work has been carried out by them in the laboratories of the Department of Electrical and Electronic Engineering under the Faculty of Engineering, Sonargaon University (SU) in partial fulfillment of the requirements for the degree of Bachelor of Science in Electrical and Electronic Engineering.

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We are, indeed, grateful to all those from whom we got sincere cooperation and help for the preparation of this report

ABSTRACT

We've create a IOT Based Project called "IOT Based Home Appliances Automation system " the most important part of the total system is the make sure the power supply or proper power supply for our all component. Our project Deals with IOT based home automation system.

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LIST OF ABBREVIATIONS

DC	Direct Current
AC	Alternating Current.

CHAPTER I

INTRODUCTION

1.1 Introduction:

We've Create a IOT Based Project called "IOT Based Home Automation system " the most important part of the total system is the make sure the power supply or proper power supply for our all component. Our project Deals with IOT based home automation system.

1.2 Background Study:

The concept of “Home Automation” has been in existence for several years. “Smart Home”, “Intelligent Home” are terms that followed and is been used to introduce the concept of networking appliance within the house. Home Automation Systems (HASs) includes centralized control and distance status monitoring of lighting, security system, and other appliances and systems within a house. HASs enables energy efficiency, improves the security systems, and certainly the comfort and ease of users. In the present emerging market, HASs is gaining popularity and has attracted the interests of many users. HASs comes with its own challenges. Mainly being, in the present day, end users especially elderly and disabled, even though hugely benefited, aren’t seen to accept the system due to the complexity and cost factors.

1.3 Objectives:

The main objective of this system is to introduce a automated IOT Based Home Appliances Automation System with IOT technology. The supplementary objectives of this project are as follows:

The objectives of this project:

The main objective of home automation and security is to help handicapped and aged people that will enable them to control home appliances and alert them in critical situations and others in below -

- Comfort and convenience.
- Energy efficiency.
- Safety and security.
- Flexibility and customization.

1.4 Project Organization:

In this report, Chapter one covers introduction, background, objectives. Chapter two represents theory, description of the AC 220V Power Supply, DC 5V, 4 channel Relay Module, ESP8266 Module and other components. Chapter three describes and working principle of the project. In chapter four we have discussed result and discussion, cost estimation, future modification, conclusion.

CHAPTER II

THEORY OF THE PROJECT

2.1 Introduction

This chapter includes the total over view of the device. In this chapter we have followed-up the theory of briefly describe of AC 220V Power Supply, Adapter ,DC 5V ,4 channel Relay Module, ESP8266 Module and other components. froject board, and other components. Here we can know that the total system overview of the projects. And we will also know that how the equipment are working with each other.

2.2 Theory

We have developed a system that can handle this complex switching situation perfectly. Our system has multiple sensors to detect my command. IOT or internet of things is an upcoming technology that allows us to control hardware devices through the internet. The most important part of the total system is the make sure the power supply or proper power supply for our all component. Our project Deals with IOT based home automation system.

2.2.1 Power Supply

A power supply is an electronic Power Supply that incorporates a switching regulator to convert electrical power efficiently.

Like other power supplies, transfers power from a AC source to loads, such as a personal computer, while converting voltage and current characteristics. Unlike a linear power supply, the pass transistor of a switching-mode supply continually switches between low-dissipation, full-on and full-off states, and spends very little time in the high dissipation transitions, which minimizes wasted energy. A hypothetical ideal switched-mode power supply dissipates no power.Voltage regulation is achieved by varying the ratio of on-to-off time In contrast, a linear power supply regulates the output voltage by

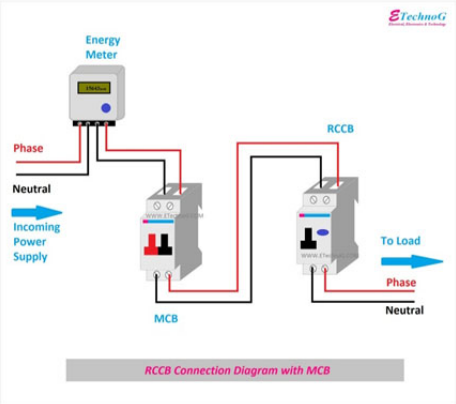


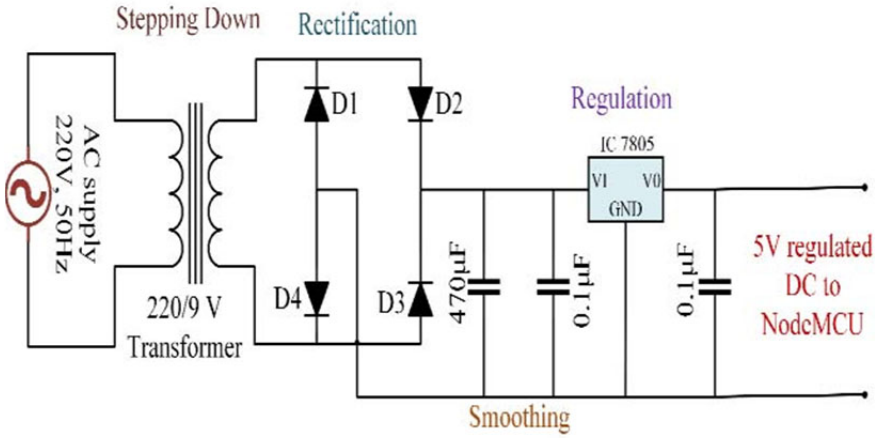
Fig: AC 220V Power Supply

Higher electrical efficiency is an important advantage. Switched-mode power supplies can also be substantially smaller and lighter than a linear supply because the transformer can be much smaller. This is because it operates on a high switching frequency which ranges from several hundred KHZ to several MHz in contrast to the 50 or 60 Hz mains frequency. Despite the reduced transformer size, the power supply topology and the requirement for electromagnetic interference (EMI) suppression in commercial designs result in a usually much greater component count and corresponding circuit complexity.

Switching regulators are used as replacements for linear regulators when higher efficiency, smaller size or lighter weight is required. They are, however, more complicated; switching currents can cause electrical noise problems if not carefully suppressed, and simple designs may have a poor power factor.

2.2.2 Adapter:

Like other types of Power Supply, power supply transfers power from a source — usually an AC Inlet to DC DC 5V outlet to device powerS. Its ability to regulate the output voltage. It can increase or decrease the output voltage to maintain a constant output regardless of changes in load.



2.2.3 4 channel Relay Module:

The four-channel relay module contains four 5V relays and the associated switching and isolating components, which makes interfacing with a microcontroller or sensor easy with minimum components and connections. There are two terminal blocks with six terminals each, and each block is shared by two relays. The terminals are screw type, which makes connections to mains wiring easy and changeable.

The four relays on the module are rated for 5V, which means the relay is activated when there is approximately 5V across the coil. The contacts on each relay are specified for 250VAC and 30VDC and 10A in each case, as marked on the body of the relays.

The switching transistors act as a buffer between the relay coils that require high currents, and the inputs which don't draw much current. They amplify the input signal so that they

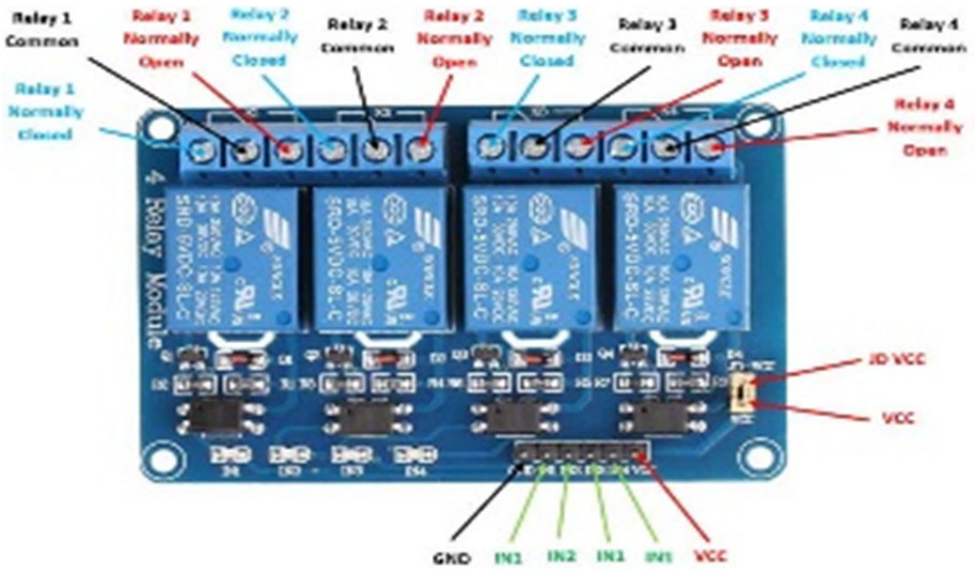


Fig: Channel Relay Module.

and the inputs. The isolation is optional and can be selected using the V_{CC} selector jumper. The input jumper contains the main V_{CC}, GND, and input pins for easy connection using female jumper wires.

2.2.4 ESP8266 Wife Module:

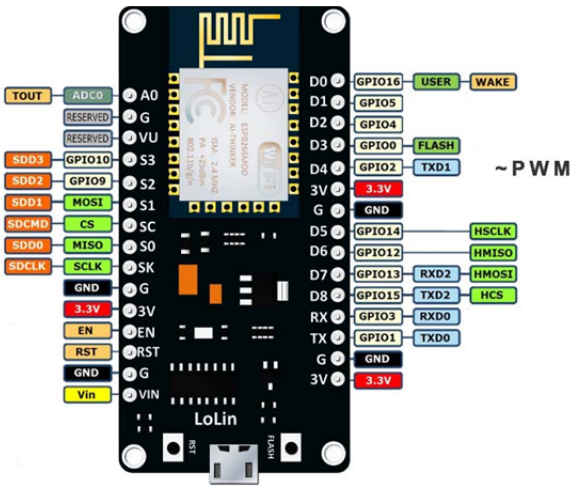


Fig: ESP8266.

IMPORTANT NOTE: Only one firmware can exist on the ESP8266. It can be either AT Commands Firmware, Node MCU Firmware or Arduino based code. Once you upload an Arduino sketch, the Node MCU firmware gets erased. If you want to work with Lua Scripts and Node MCU, then you have to flash the Node MCU Firmware.

CHAPTER III

DESING & FEBRICATION

3.1 Introduction

In this chapter fully cover with discuss design and fabrication of this project. Here we will discuss about developed block diagram and briefly describe about the circuit description and also learn about working principle. Total project flow chart is also available in this chapter.

3.2 Block Diagram:

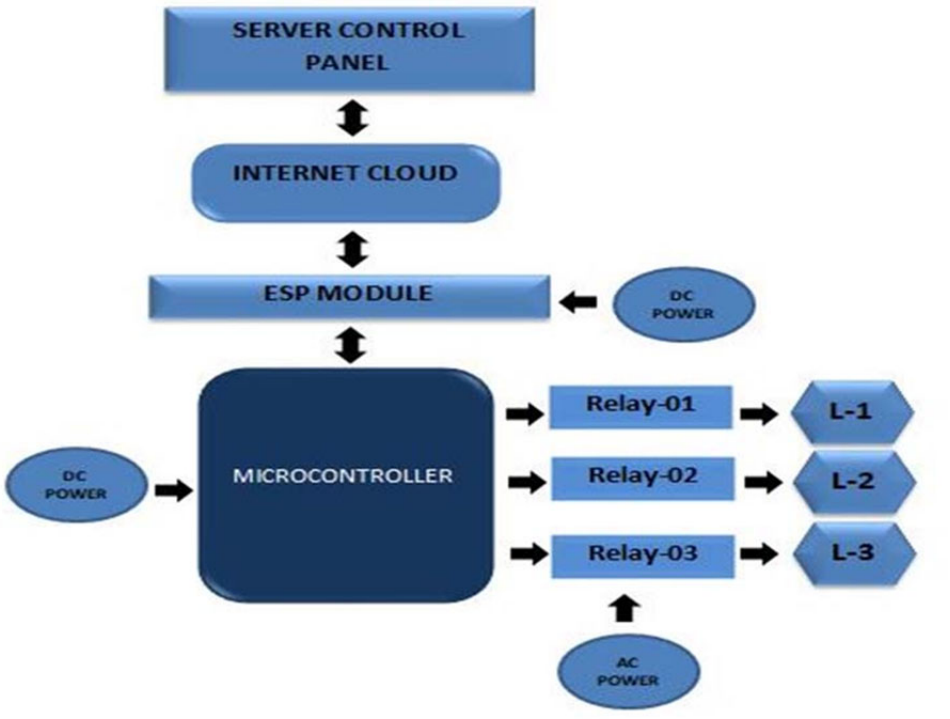


Figure: Block Diagram of the Project

Here's the block diagram of our IOT Based Integration of IOT Based Home Automation System.

3.3 Circuit Diagram:

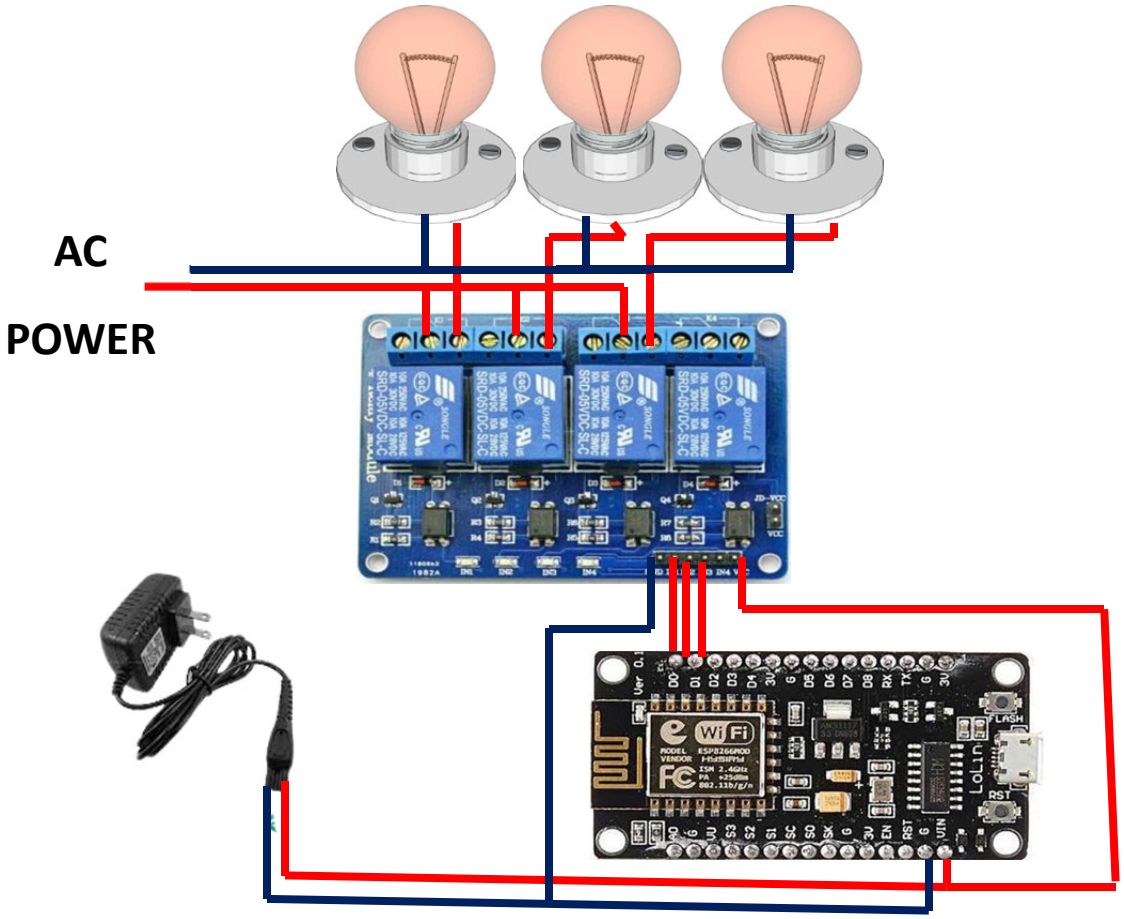


Fig: Circuit diagram of the Project.

3.4 Working Principle

The home automation circuit is built around ESP8266, IoT Remote Android App, and a 4-channel relay Module. The hardware set up should be according to the circuit diagram. AC mains appliances(Bulbs) will be connected to relays which are controlled by the ESP8266.User has to install and configure the IoT Remote App as per the above instructions. Whenever the user presses a icon in the app then that information will be send to ESP8266 via WiFi. The ESP8266 analyses the received commands and turns ON/OFF of the respective device via 4 – channel Relay board.

3.5 Image of the Project:



Fig: Project View

3.6 Flow Chart:

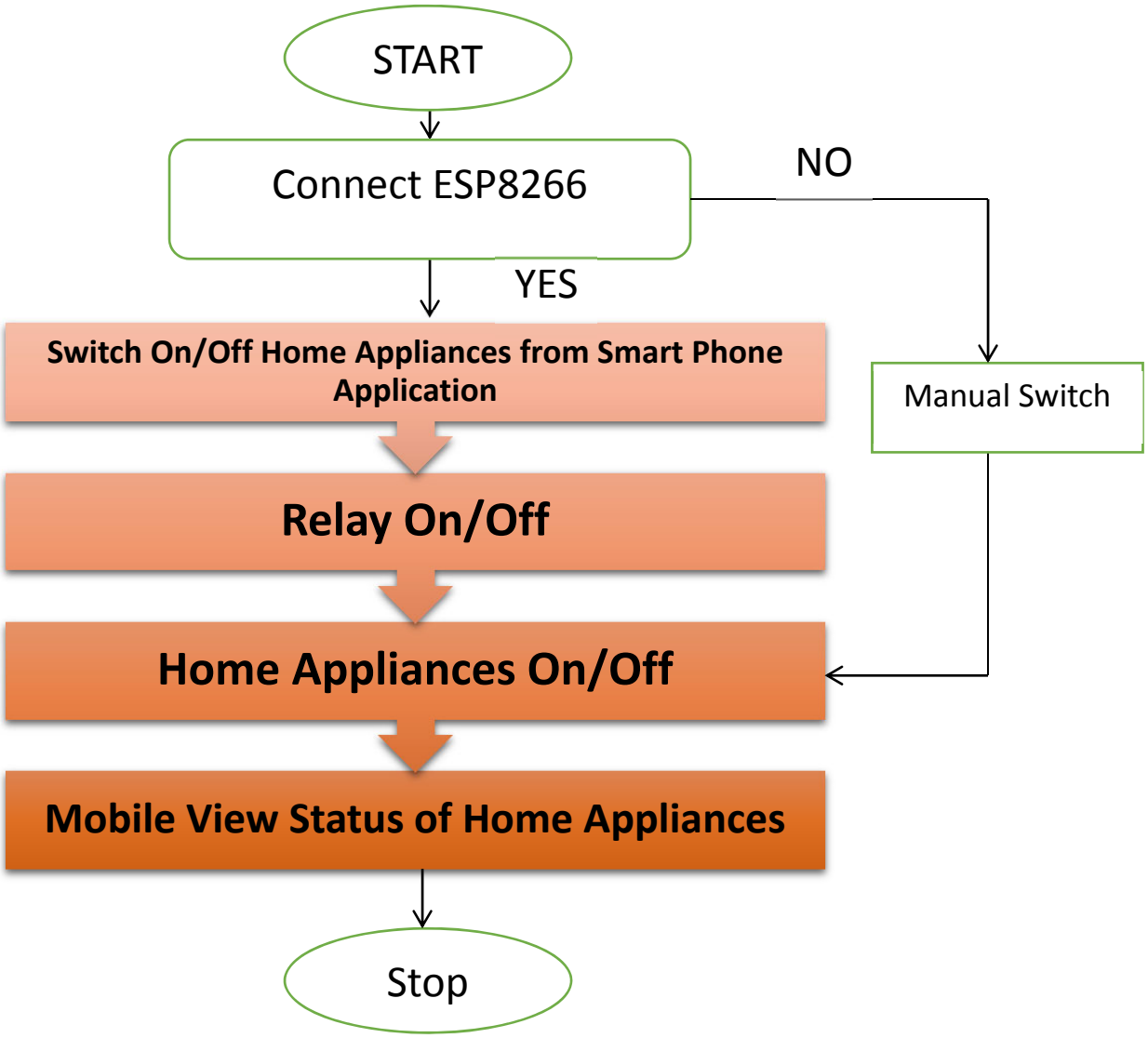


Fig: Flow chart of the project

3.7 Used Materials

- AC220V Source
- Adapter (AC220V-DC05V) 1Pcs
- ESP 8266 Wifi Module- 1pcs
- Relay Module – 1pcs
- Bread Board- 1 pcs
- Partex Wooden Board- 1 pcs
- Lamp AC 220V- 03 pcs
- Lamp Holder- 3 pcs
- USB Cable- 1 pcs
- Android Phone with IoT Remote App
- 2 Pin Plug- 01 pcs
- Connecting Wires
- PVC Channel

3.8 Conclusion

In this chapter we have discussed the block diagram,circuit discription, working principle, flow chart also show the real image of the project and others. In the later part of this paper we discussed the result & discussion of the project to make the concept clear to anyone.

Chapter IV
RESULT & DISCUSSION

4.1 Introduction

This chapter contains the results obtained and discussion about the project. We have also covered discussions about advantages, disadvantages and limitation of current version of the protection system.

4.2 Result

- Through this system we can automatically control the load from anywhere in the house and solve our problems.
- So, use of automatic Home automation control system.

4.3 Advantags

- Minimizes the human work and effort.
- Saves time and effort.
- Good for personal safety and security.
- Useful in traffic and other tracking or monitoring systems.
- Improved security in homes and offices.
- Reduced use of many electronic devices as one devise does the job of a lot of other devices.

4.4 Disadvantages

- Increased privacy concerns.
- Increased unemployment rates.
- Highly dependent on the internet.
- Lack of mental and physical activity by humans leading to health issues.
- Complex system for maintenance.
- Lack of security.
- Absence of international standards for better communication.

4.5 Discussion

By implementing above systems there are various benefits.

- Load can be controlled from any location, the system can be controlled.
  If the load is on, the electricity bill will be higher, so if the load is controlled, the bill will be lower.
- The design is low cost, small size, robust and highly versatile.
- This system use IOT which make it more convenient than conventional system.
- The main advantage is that the system's action can be changed according to the situation.

4.6 Cost Estimation

Table:4.1: Cost Estimation

SI	Particulars	Specification	Qty.	Unit Price	Total Price
1	Adapter	5V DC, 5A	1	200	200
2	Relay Module.	DC 5V, 4 channel	1	500	500
3	ESP 8266 Wife Module	ESP 8266	1	800	800
4	Bread Board	Bread Board	1	160	160
5	Lamp Holder	Batten	3	120	120
6	Lamp	Lamp LED	3	120	120
7	Wooden Board	Wooden Board	1	100	97
8	Power Cabale	Power Cabale			100
				Total	**2200**

4.7 Applications

Automatic IOT Based home automation System plays an important role in modern smart technologies. This project can be used in the more. This project can be used in offices shops factories. Following are the most common applications of Automatic IOT Based home automation System.

4.8 Conclusion

Due to increase in population Buildings are in eve sing to. It somehow a any happiness in the home this automated system can be very useful to. Seven times and this in also very important for the home.

Chapter V

CONCLUSION

5.1 Conclusion

This project is very usefull for industrial automation that will help people to balance the load of home appliance . Due to increase in population Buildings are in eve sing to. It somehow
a any happiness in the home this automated system can be very
useful to. Seven times and this in also very important for the home.

5.2 Future Work

At present we have made this automated system for our home
but as we deserved earlier. The needs to be upgraded. As a future
work we can develop it for every see tony by automated.

References:

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Web Address :
[3] www.circuitstoday.com
[4] www.engineersgarage.com
[5] www.learn.adafruit.com
[6] www.instructables.com


```
/*
  Sketch generated by the Arduino IoT Cloud Thing "Untitled"
  https://create.arduino.cc/cloud/things/d4bf9c7a-8d39-4ddc-9556-5074339b050b

  Arduino IoT Cloud Variables description

  The following variables are automatically generated and updated when changes are made to the Thing

  bool switch1;
  bool switch2;
  bool switch3;

  Variables which are marked as READ/WRITE in the Cloud Thing will also have functions
  which are called when their values are changed from the Dashboard.
  These functions are generated with the Thing and added at the end of this sketch.
*/

#include "thingProperties.h"
```

```
void setup() {
  pinMode(D0,OUTPUT);
  pinMode(D1,OUTPUT);
  pinMode(D2,OUTPUT);
  // Initialize serial and wait for port to open:
  Serial.begin(9600);
  // This delay gives the chance to wait for a Serial Monitor without blocking if none is found
  delay(1500);

  // Defined in thingProperties.h
  initProperties();

  // Connect to Arduino IoT Cloud
  ArduinoCloud.begin(ArduinoIoTPreferredConnection);

  /*
     The following function allows you to obtain more information
     related to the state of network and IoT Cloud connection and errors
     the higher number the more granular information you'll get.
     The default is 0 (only errors).
     Maximum is 4
  */
  setDebugMessageLevel(2);
  ArduinoCloud.printDebugInfo();
}
void loop() {
  ArduinoCloud.update();
  // Your code here


}

/*
```

```
    Since Switch1 is READ_WRITE variable, onSwitch1Change() is
    executed every time a new value is received from IoT Cloud.
*/
void onSwitch1Change() {
    if (switch1)
    {
    digitalWrite(D0,LOW);
    }
    else
    {
    digitalWrite(D0,HIGH);
    }
    // Add your code here to act upon Switch1 change
}

/*
    Since Switch2 is READ_WRITE variable, onSwitch2Change() is
    executed every time a new value is received from IoT Cloud.
*/
void onSwitch2Change() {
    if (switch2)
    {
    digitalWrite(D1,LOW);
    }
    else
    digitalWrite(D1,HIGH);
    }
    // Add your code here to act upon Switch2 change
}

/*
    Since Switch3 is READ_WRITE variable, onSwitch3Change() is
    executed every time a new value is received from IoT Cloud.
*/
```

```
void onSwitch3Change() {
  if (switch3)
  {
    digitalWrite(D2,LOW);
  }
  else
  {
    digitalWrite(D2,HIGH);
  }
  // Add your code here to act upon Switch3 change
```