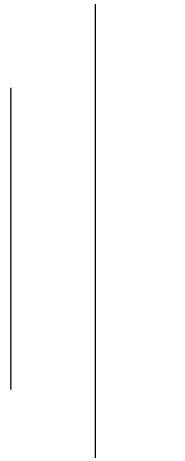




**COLLEGE OF MANAGEMENT &
INFORMATION TECHNOLOGY**

BACHELOR IN CYBER SECURITY (CS & NT)
Internet of Things (IOT)



**Project Report on
Home Automation**

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We are also thankful to the Texas Int'l College for providing us a platform and all the required materials for the project.

ABSTRACT

The main concept of building the home automation is about dealing with the power consumption, remote control over home appliances, and comfort.

Home Automation is a way to have things around your home happen your digital presence. The first thing that comes to mind when folks think of home automation are robots, complicated electronics and a general feeling that their home is less of a warm home and more of a cold science experiment.

You may not think of a dishwasher or light switch as home automation, but compared to washing dishes by hand and striking a match to light a candle every time you enter a room, it's definitely automation.

Keywords: Automation, Internet of Things, Node MCU, Relay.

Introduction

Home Automation is simply defined as the control over home appliance by the digital commands by the owner and known as the best example of Internet of Things.

In this term, Home automation is the condition in which all the electrical devices are controlled by the user with the use of a switch named Relay which is governed by the commands forwarded by the Node MCU. Industries consist of large automations and robotic functionalities. But home automation brings the complex and useful automation on the finger clicks and even our voice commands.

The internet facility is must to communicate between the user and the home so that a home could be fully standardized. Wherever the user remains, he would be able to fluctuate the appliance activity through his smart devices.

Objectives

- To reduce the unnecessary usage of electrical energy.
- To reduce the accidents occurred by electrical appliance with the help of remote control over them.
- To help the physically disabled peoples.
- To inspire new youths that what we dream to develop isn't impossible excluding the determination.
- To maintain the comfort and quality of life by new technology.
- Proper utilization of the features of the wireless communication and Internet Of Things.

Problem Statement

Every creation is to overcome the problem in a simple and efficient way. There are a lot of problems that we face daily in homes. So, home automation is the best way to solve those problems.

Some of the problems are:

1. Physically disabled people are unable to control home appliances.
2. Lots of accidents occur due to electrical issues.
3. We face overconsumption of electricity at homes.

Applications

1. Can be used in personal homes as a new updated feature of technology.
2. Can control the appliances remotely from anywhere the user staying.
3. Also can be used to avoid unusual consumption of electricity.
4. Helpful in avoiding the accidents.
5. Most efficient for disabled persons.

Methodology

For setting the Automation, we need all the hardware and software components. With those aside we can start to build the automation project.

First of all, we need to add Download the Arduino IDE in PC. Now, we need to add **ESP8266** library in arduino library in order to support node mcu board in the Arduino IDE.

Download Blynk library setup file from github and add to Arduino IDE, with this added we can run Blynk application in the Arduino IDE.

Next step, we need to download blynk app from play store in our smart phone. We need add a new project in the Blynk app. The authentication token is send to our associate mail. This auth token is added in coding to verify the node MCU and to role we have given it to play. In our project we use this to turn on and turn off the appliances. After this, we will choose Node MCU in the hardware ESP8266 configuration and choose WI-FI in connectivity. We have added two buttons in the project and make it function able with selection port of node MCU (d0 and d1).

With mobile setup done, we need to write code and upload it to node MCU. Here, we have added the network SSID and its password and also auth token.

Meanwhile, the software setup id is done.

In hardware ends the relay module is connected to node MCU with jumper wires. Here the jumper wires in node

MCU port (D0 and D1) are connected to In1 and In2 of relay module. Gnd of node MCU is connected to Gnd of relay module. The Vcc port of relay module is connected to Vin of node MCU. At last, the two port of relay module is short circuit (..... and) by connecting both by jumping wires.

In relay module the open port are supplied with AC current by black and red wires. The positive terminal is made common wire in relay board to connect and supply voltage to 2nd appliances and 1st appliances is direct connected to relay module.

With all hardware and software setup is done we plug in the power supply and powered the node MCU, the smart phone is connected to the node MCU. Now, we open Blynk application and we can see node MCU is online and ready to execute the command signal to relay board.

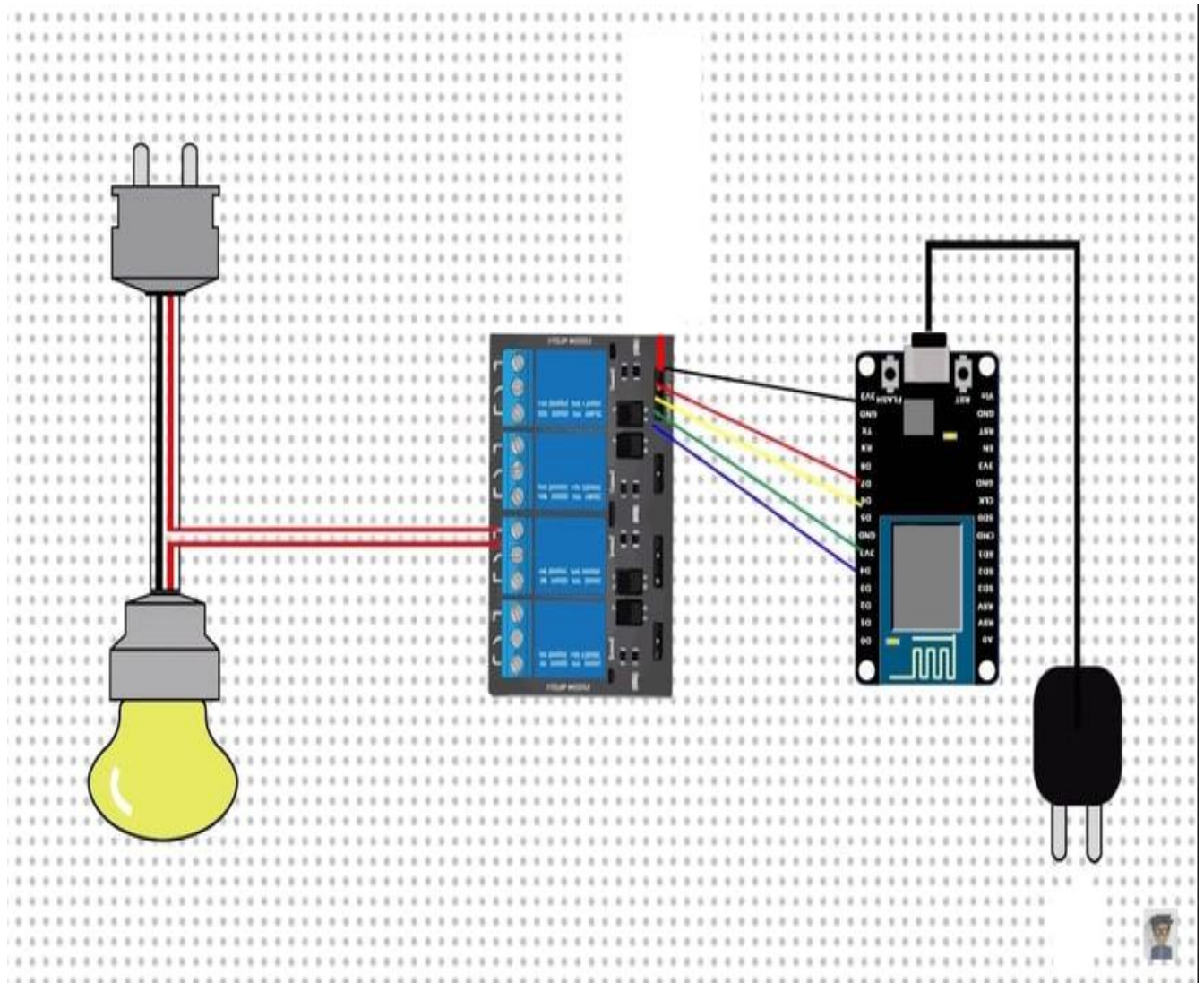
When we change the setting of button from push to switch it is ready to work.

When we on-off the button appliance is turn on and turn off.

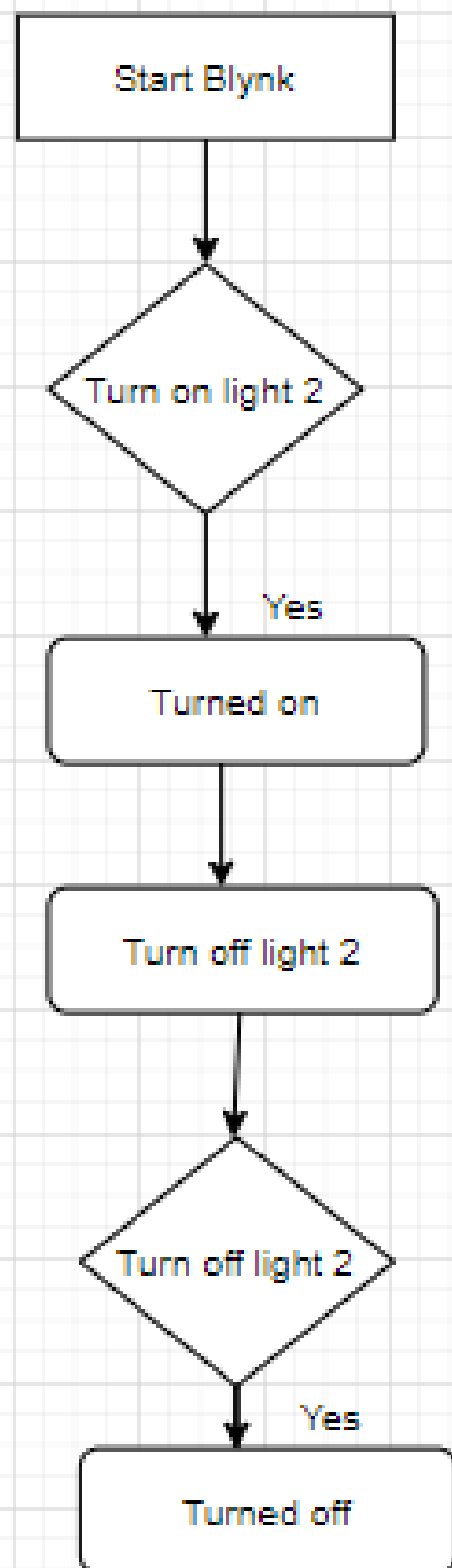
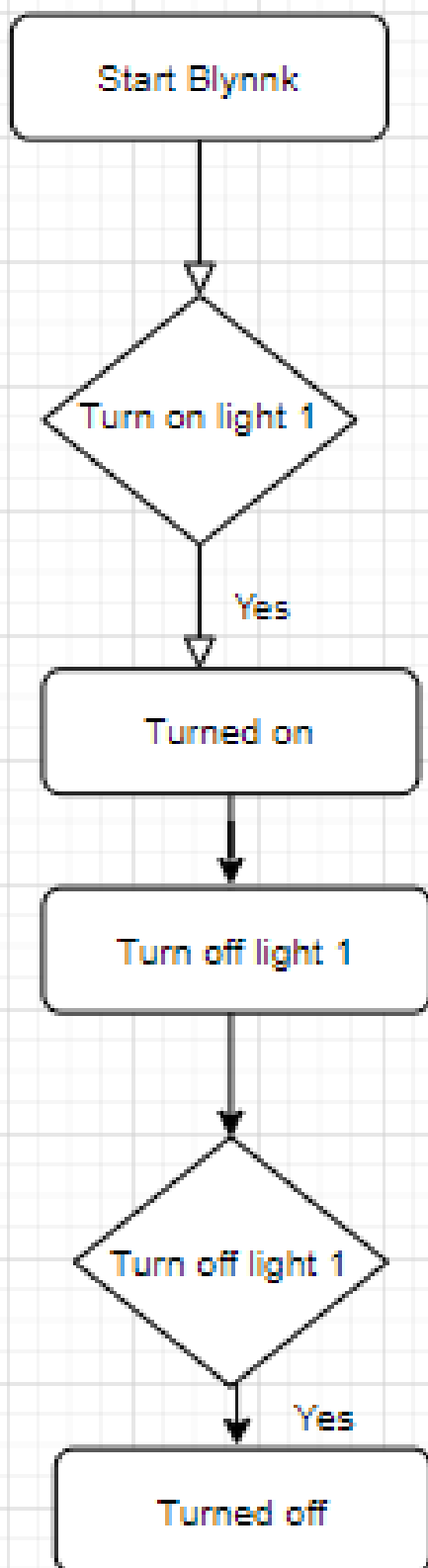
#Note:

For the automation with the goggle voice, we have added the IFTTT configuration. This is basically connecting the node MCU with the Blynk cloud and when we give command with voice it sends the signal to node MCU and make the appliances turn on/off.

Block Diagram



Algorithm & Flowchart



Hardware and Software used

Hardware Required:

- **Node MCU:**

Node MCU is an open source firmware for which open source prototyping board designs are available. The name "Node MCU" combines "node" and "MCU" (micro-controller



unit).The term "Node MCU" strictly speaking refers to the firmware rather than the associated development kits.

Node MCU is an embedded IOT platform, the board is just like an Arduino which comes with a (ESP8266) wifi module built-in.

- **Relay Module:**

A relay is an electrically operated switch. It consists of a set of input terminals for a single or multiple control signals, and a set of operating contact terminals. The switch may have any number of contacts in multiple contact forms, such as make contacts, break contacts, or combinations. Relays are used where it is necessary to control a circuit by an independent low-power signal, or where several circuits must be controlled by one signal.



- Bread board
- Jumper wire
- Red and black wire
- 2-pin Male socket
- Holder, bulb and ply.

In Software end:

- Arduino IDE
- Blynk Library setup in arduino IDE
- Blynk Mobile app
- IFTTT configuration (For goggle voice).

Result

Finally, we got the result successfully. The Node MCU is properly communicating with the user via Internet and controlling the Relay (switch). So, we can turn on/off the electric appliances in the home from anywhere where there is the access of internet with the use of Blynk application which works as a button in user interface and Google assistant which deals with the digital voice input.

Reference

We took the reference from Raju Shrestha as he gave the idea about home automation. In other humorous reference we were inspired by the 'JARVIS' features as the AI system in Iron man and rest MARVEL films.