PROJECT REPORT

On

IOT Based HOME AUTOMATION

(CSE IV Semester Mini Project)

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ACKNOWLEDGEMENT

In successfully completing this project, many people have helped me. I would like to thank all those who are related to this project.

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INTERNET OF THINGS

The **Internet of things** (**IoT**) describes the network of physical objects—a.k.a. "things"—that are embedded with sensors, software, and other technologies for the purpose of connecting and exchanging data with other devices and systems over the **Internet.**

Things have evolved due to the convergence of multiple technologies, real-time analytics, machine learning, commodity sensors, and embedded systems. Traditional fields of **embedded systems**, wireless **sensor networks, control systems,** automation (including home and building automation), and others all contribute to enabling the Internet of things. In the consumer market, IoT technology is most synonymous with products pertaining to the concept of the **"smart home"**, including devices and appliances (such as lighting fixtures, thermostats, home security systems and cameras, and other home appliances) that support one or more common ecosystems, and can be controlled via devices associated with that ecosystem, such as smartphones and smart speakers. IoT can also be used in **healthcare systems**.

There are a number of serious concerns about dangers in the growth of IoT, especially in the areas of privacy and security, and consequently industry and governmental moves to address these concerns have begun including the development of international standards.

A **home automation** system is an automating the bulk of electronic and electrical tasks within a **home**. It uses a combination of hardware and software to enable control and management over appliances and devices within a **home**.
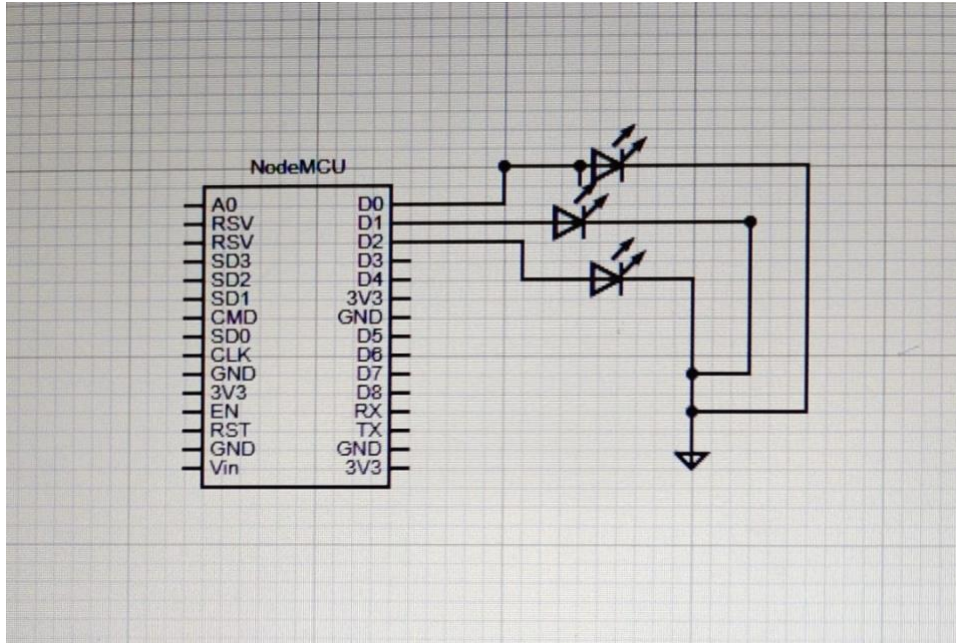
Home automation not only refers to reduce human efforts but also energy efficiency and time saving. Here we are performing home automation by using ESP8266 – WiFi SoC and Blynk App.

COMPONENTS REQUIRED

- ESP8266
- LED
- Breadboard
- USB Cable
- Connecting Wires
- Android Phone with Blynk App

HARDWARE

Circuit Diagram

Circuit Diagram Explanation

NodeMCUto 3-LEDs

- Connect D0 pin of NodeMCU to LED 1.
- Connect D1 pin of NodeMCU to LED 2.
- Connect D2 pin of NodeMCU to LED 3.
- Connect GND pin of NodeMCU to GNDpin of each LED respectively.

SOFTWARE

Blynk Library Installation

1. Download the zip file for Blynk Library : Blynk_Release_v0.4.8
2. Extract the downloaded zip file in a folder.
3. Open up Arduino IDE, go to: File -> Preferences and under the *Settings* tab, copy the sketchbook location path.
4. Now open the file explorer and go to the copied path location. This is the path where all the libraries are installed. So, we have to copy all the newly downloaded Blynk libraries into this folder.
   - Copy the files/folders from the Libraries folder of the downloaded Blynk directory, and paste it to the Libraries folder of your Arduino IDE's directory (The path which we copied in step 3).
   - Similarly, copy the files/folder from the Tools folder of the downloaded Blynk directory, and paste it to the Tools folder of your Arduino IDE's directory.

Installation and Configuration of Blynk App

5. Firstly install "Blynk" application from play-store and open it.
6. Create an account by using Email account or Facebook account.
7. Click on New Project, enter the Project Name (enter the Project Name according to your wish) as "**Home Automation**", Choose Device as "**NodeMCU**", Connection Type as "**Wi-Fi**" and then click "**Create**" icon.
8. After the creation of Project, App will send the **Auth Token** code to registered Email ID.
9. Click on the "+" icon which located on top right side of the app to create buttons.
10. Enter the button name and select the GPIO pins (exmaple: D0, D1, D2)

APPLICATIONS

- Using this project, we can turn on or off appliances remotely i.e. using a phone or as connected to internet, we can control the home from remote location over internet and also monitor the safety.
- The project can be further expanded to a smart home automation system by including some sensors like light sensors, temperature sensors, safety sensors etc. and automatically adjust different parameters like room lighting, air conditioning (room temperature), door locks etc. and transmit the information to our phone.
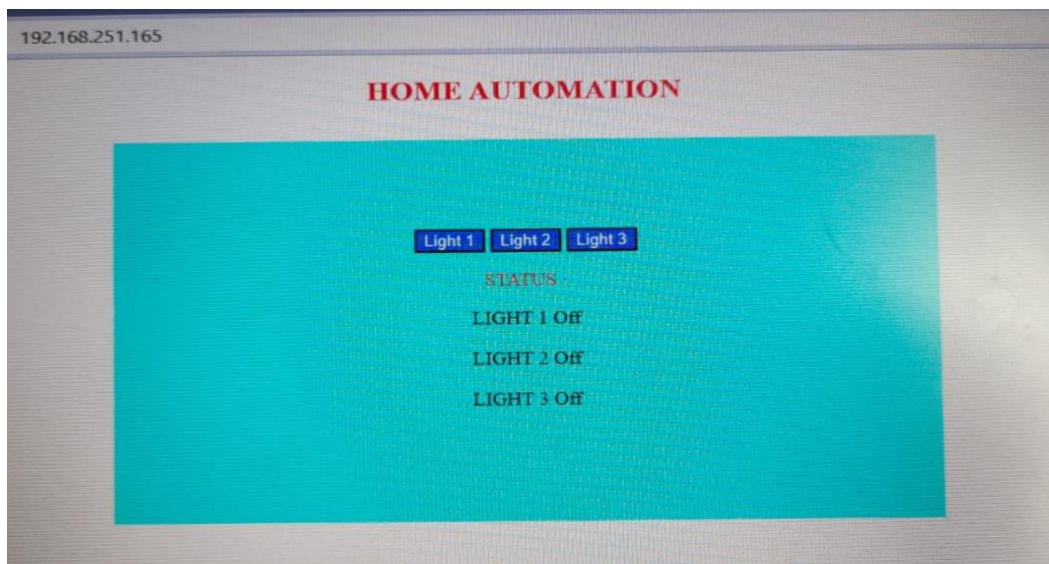
LIMITATIONS

- The system needs a continuous power supply to be practical or else we might not be able to control the appliances.
- Hence, best way to design the system efficiently would be to implement both the automated control and manual control through switches at a time
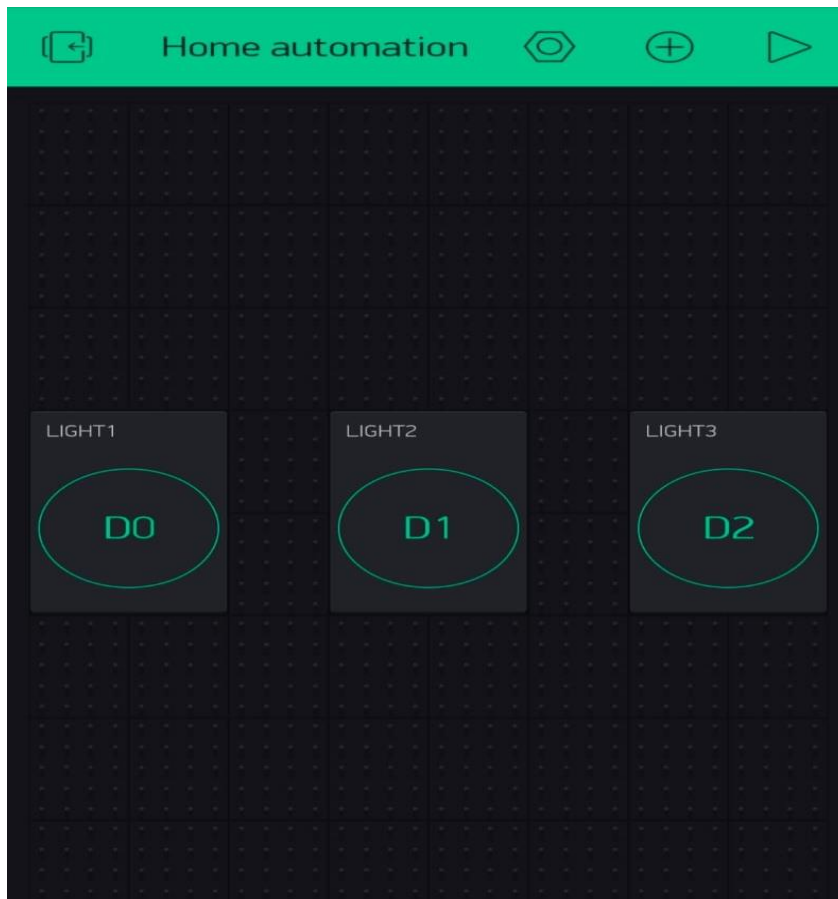
PROJECT IMAGES
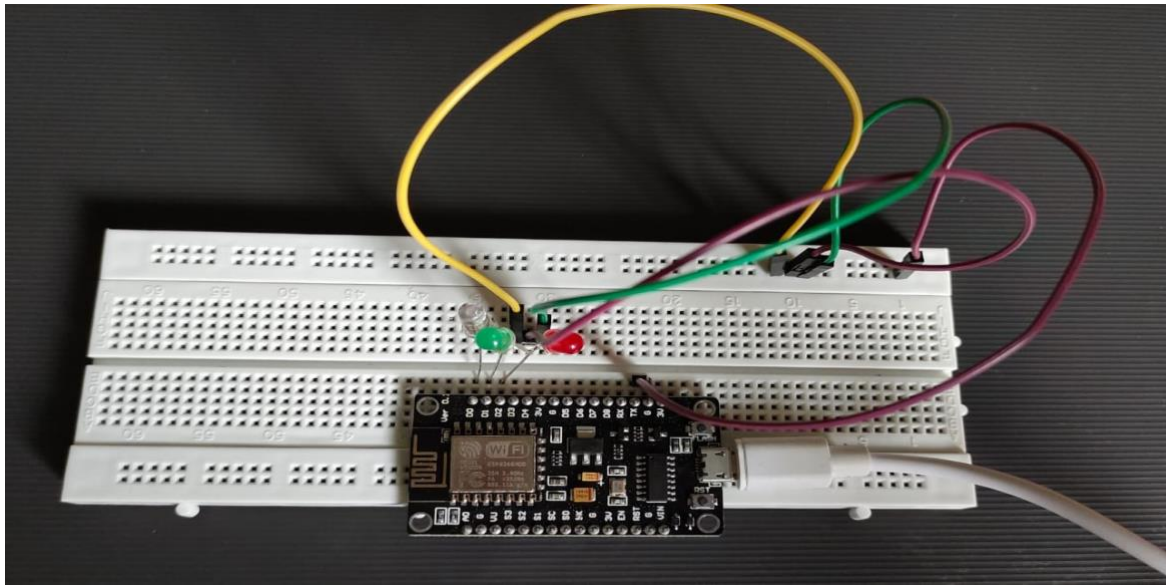
1. Model of project

2. Web Page for Project Controlls

3. Blynk App (control lights)

CODE

```
#include<ESP8266WiFi.h>
#define BLYNK_PRINT Serial
#include <BlynkSimpleEsp8266.h>

char auth[] = " Fxu84-44_sJFViPlXb34rtQS5XMgaasP";
#define ssid "Vivo V20"
#define pass "kanchanr"

WiFiServer server(80);

int m=0;
int n=0;
int p=0;
void setup(){
Serial.begin(9600);
Blynk.begin(auth, ssid, pass);
WiFi.begin(ssid, pass);
Serial.println("Connecting to N/W ...");
while(WiFi.status()!=WL_CONNECTED){
delay(400);
Serial.print(".");
}
Serial.println("");
Serial.println("Connected to N/W");
server.begin();
Serial.println("");
Serial.print("Use this IP: ");
Serial.print(WiFi.localIP());
pinMode(D0, OUTPUT);
digitalWrite(D0,0);
pinMode(D1, OUTPUT);
digitalWrite(D1,0);
pinMode(D2, OUTPUT);
digitalWrite(D2,0);

}

void loop(){
Blynk.run();
WiFiClient client =server.available();
if(!client){
return;
}
```

```
String request = client.readStringUntil('\r');
if(request.indexOf("/light1")!=-1){
m=!m;
digitalWrite(D0, m);
}

if(request.indexOf("/light2")!=-1){
n=!n;
digitalWrite(D1, n);
}
if(request.indexOf("/light3")!=-1){
p=!p;
digitalWrite(D2, p);
}

client.print("<!DOCTYPE html>\n");
client.print("<html>\n");
client.print("<head>\n");
client.print("\t<title>My Dashboard</title>\n");
client.print("</head>\n");
client.print("<body><center>\n");
client.print("\t<h2 style= \"color : red\">HOME AUTOMATION</h2>\n");
client.print("    <div style=\"margin-top: 30px; margin-bottom: 50px; background-color:
cyan; margin-right: 350px; margin-left: 350px; padding-top: 80px; padding-bottom :
80px;\">\n");
client.print("    \t\t<a href=\"light1\"><button style= \"background-color : blue; color :
white;\">Light 1</button></a>");
client.print("    <a href=\"light2\"><button style= \"background-color : blue; color :
white;\">Light 2 </button></a>");
client.print("    <a href=\"light3\"><button style= \"background-color : blue; color :
white;\">Light 3</button></a><p style= \"color : red;\">STATUS : <br></p> ");

if(m==1)
client.print("LIGHT 1 On<br><br>");
if(m==0)
client.print("LIGHT 1 Off<br><br>");
if(n==1)
client.print("LIGHT 2 On<br><br>");
if(n==0)
client.print("\t\tLIGHT 2 Off<br><br>");
if(p==1)
client.print("\t\tLIGHT 3 On<br><br>");
if(p==0)
client.print("\t\tLIGHT 3 Off<br><br>");
client.print(" </div></center>\n");
```

```
client.print("   <marquee style=\"color: red;\">Your Homeautomation subscription is
ending next month on 10th Nov, 2020.</marquee>\n");
client.print("</body>\n");
client.print("</html>");
}

/*WiFi.status();
IF CONNECTED = WL_CONNECTED
NOT CONNECTED = NO_SHIELD
DISCONNECT = WL_DISCONNECTED
*/
```

WORKING

The home automation circuit is built around ESP8266, Blynk Android App, web browser and a 3-LEDs. The hardware set up should be according to the circuit diagram. AC mains appliances(LEDs) will be connected to app and browser which are controlled by the ESP8266.

User has to install and configure the Blynk 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 .

Also, we can use the IP address visible in the serial port to connect the device with the internet and then we can switch ON/OFF the device according to our wish.