Name of the Students:	Roll No.	Date:

Experiment No. – 08

Title: Implement smart home automation system. The system automates home appliances and controls them over internet from anywhere.

**Hardware Requirements:** NodeMCU, Relay, AC Bulb

Software Requirements: Arduino IDE, Google Firebase, Android App

Theory:

NodeMCU:

NodeMCU is Lua based firmware of ESP8266. Generally, ESPlorer IDE is referred for writing Lua scripts for NodeMCU. It requires getting familiar with ESPlorer IDE and Lua scripting language.

There is another way of developing NodeMCU with a well-known IDE i.e. Arduino IDE. We can also develop NodeMCU applications using the Arduino development environment. This makes things easy for Arduino developers than learning a new language and IDE for NodeMCU.
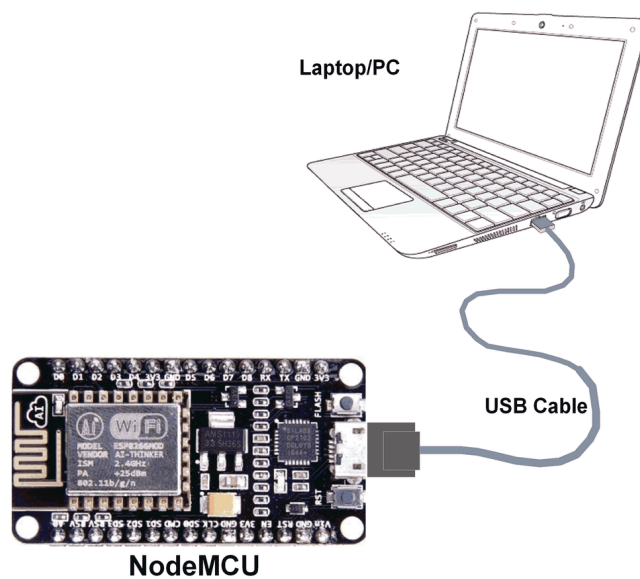
Relay:

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 thereof.
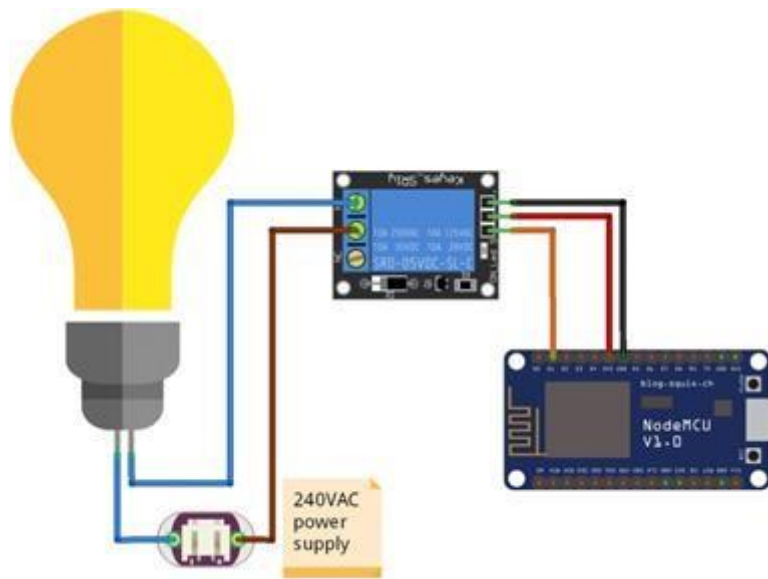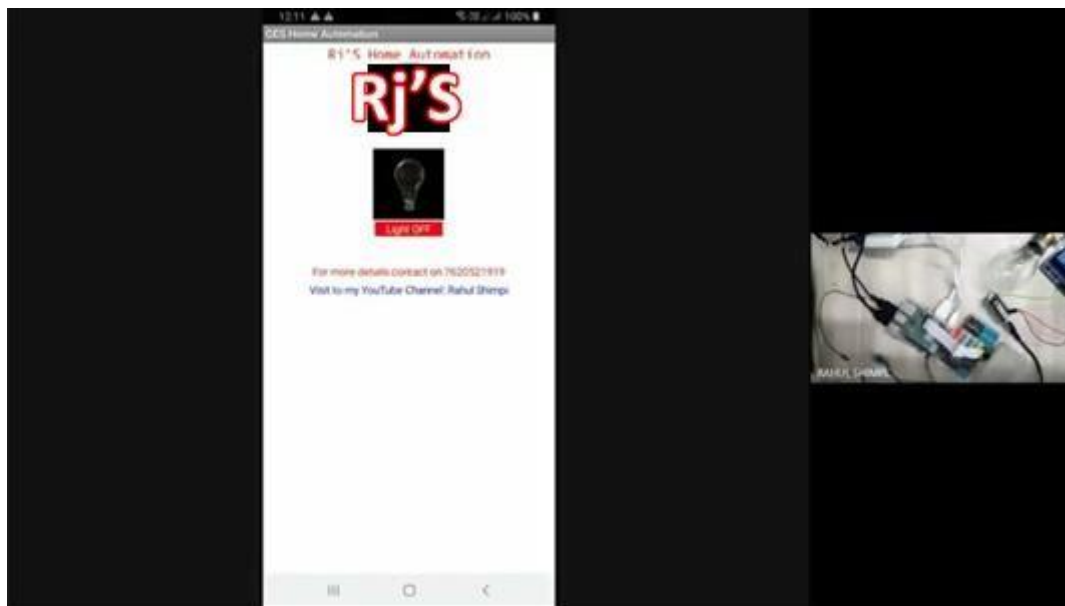

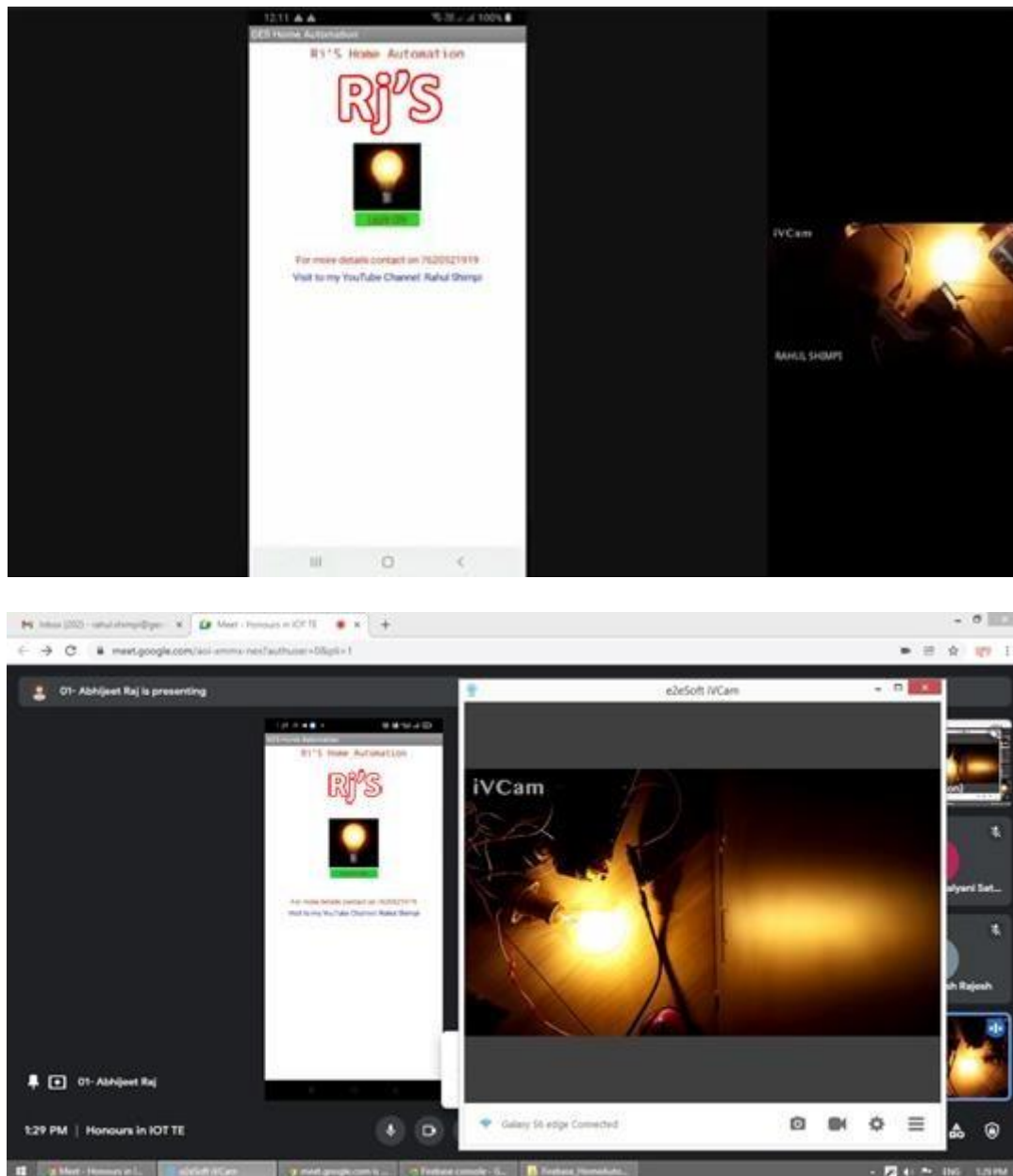**Fig.1 Circuit diagram of Home Automation System**

Fig.2 Actual Result

Procedure:

- Make the connection as per circuit diagram
- Open Arduino IDE
- Select the NodeMCU ESP8266
- Select the communication Port
- Write code in Editor Window and save file
- Compile the code
- Upload the code
- Open the Android app
- Control the appliances

Conclusion:

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Tinkercad Simulation Link:
https://www.tinkercad.com/dashboard?type=circuits&collection=designs

Code:

```
#include <FirebaseESP8266.h>
#include  <ESP8266WiFi.h>
#define ssid "RAHULSHIMPI" //WiFi SSID
#define password "12345678#"  //WiFi Password
#define FIREBASE_HOST "ehas-1234-default-rtdb.firebaseio.com"
#define FIREBASE_AUTH "o8ctQwHRzCTPRVyjMeeiqJSm3v3RSYJAB96pAQsJ"
//If using Relay Module
int Device_1 = D0; //initialize D6 Pin
void setup()
 {
  Serial.begin(9600);
  WiFi.begin (ssid, password);
  while (WiFi.status() != WL_CONNECTED)
       {
       delay(500);
       Serial.print(".");
       }
  Serial.println ("");
  Serial.println ("WiFi Connected!");
  Firebase.begin(FIREBASE_HOST,FIREBASE_AUTH);
  pinMode(Device_1,OUTPUT);//initialize the Device OUTPUT
}
void loop()
 {
 if (Firebase.get(firebaseData,"/D1")) {
  if (firebaseData.dataType() == "string") {
    String De1 = firebaseData.stringData();
      if (De1=="1"){
         digitalWrite(Device_1,HIGH); //Device1 is ON
       }
      else if (De1=="0"){
         digitalWrite(Device_1,LOW);//Device1 if OFF
        }}}
 }
```