

A PROJECT ON INTERNET OF THINGS

# SMART HOME AUTOMATION SYSTEM

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## CERTIFICATE

This is to certify that the thesis entitled "SMART HOME AUTOMATION SYSTEM", submitted by VISHWA HARIHARAN IYER (RA1811003010049), first year B.TECH (Computer Science and Engineering) from SRM Institute of Science and Technology and UTTAM KUMAR DAS (18230835125), second year B.Tech(Electronics and Communication Engineering) from RVS College of Engineering and Technology is a record of an original research work carried out by them under my supervision and guidance.

Guided By-

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ER. Subhajit Kundu

Date:

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## ACKNOWLEDGEMENT

First and foremost, we feel it as a great privilege in expressing our deepest and most sincere gratitude to our supervisor Er. Subhajit Kundu, for his excellent guidance throughout our project work. His kindness, dedication, hard work and attention to detail have been a great inspiration to us. Our heartfelt thanks to you sir for the unlimited support and patience shown to us . We would particularly like to thank him for all his help in patiently and carefully correcting all our manuscripts.

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## **INTRODUCTION**

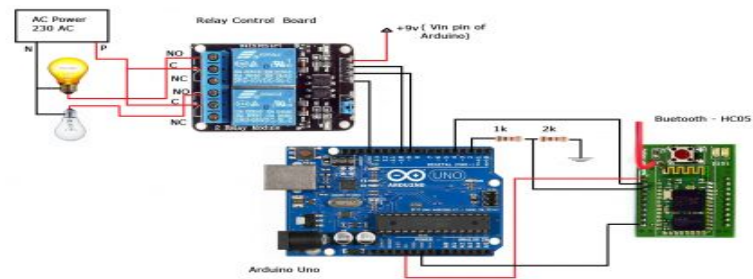
Smart Home Automation System is a well structured design installed in houses which is controlled by bluetooth via phones and also by voice recognition process. In brief, there will be a gate through which people may enter and exit controlled by a servo motor. After which the changing of colors of RGB led occurs each time we press the switch controlled by mobiles. Then is controllable of relays by two switch from the phone which controls the electric supply of the system. Followed by this is the two buttons is assigned for complete on and complete off of the system. In the future each and every building would consist of these features resulting world to be a smarter place.

## **PURPOSE**

The purpose of this Project is to show how a home automation system works and gives the Idea of building a real large scale Home Automation. This system would make easy the lives of people and the place would be very smart with this Technology. People would very much appreciate the fact they could control the appliances as per their choice sitting on their couch as per their choice.

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## OVERVIEW



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## **HARDWARE**

The project of Home Automation consists of a Relay Module, Bluetooth Module, RGB led, Bread Board, Servo Motor, Resistance and Jumper wires. Here the RGB led acts as a Night light with seven different types of colors of light. The Servo Motor acts as a gate or entrance to the house.

### **Relay**

A relay operates as an electromagnetic switch. It can control a high voltage circuit by using only a low voltage control signal. The building components of an electromechanical relay are basically a fixed coil, a movable armature, a spring and contacts. The number of contacts varies from one pair to several. The coil generates a magnetic field when a low voltage control signal has been sent. As a consequence of this, the armature is attracted by the magnetic field so that it pushes the contact pair towards each other. This completes the high voltage circuit. The spring is attached between the coil and the armature. When the control signal is no longer sent to the circuit the spring pulls the armature back to its original position. Electromechanical relays are categorized into two types, Normally Open (NO) and NormalClosed (NC). The contacts on a NO relay are only closed when a current is sent through the relay. In a similar way, the contacts on a NC relay are only open when a current is sent through the relay. A NO relay is preferred when the controlled circuit will be

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off most of the time and a NC is preferred when the circuit will mostly be on .

## RGB LED

With an RGB LED you can, of course, produce red, green, and blue light, and by configuring the intensity of each LED, you can produce other colors as well. To produce other colors, you can combine the three colors in different intensities. To adjust the intensity of each LED you can use a PWM signal. Because the LEDs are very close to each other, our eyes see the result of the combination of colors, rather than the three colors individually.



To have an idea on how to combine the colors, take a look at the following chart. This is the simplest color mixing chart, but gives you an idea how it works and how to produce different colors.

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## BLUETOOTH

A Bluetooth technology is a high speed low powered wireless technology link that is designed to connect phones or other portable equipment together. It is a specification (IEEE 802.15.1) for the use of low power radio communications to link phones, computers and other network devices over short distance without wires. Wireless signals transmitted with Bluetooth cover short distances, typically up to 30 feet (10 meters).



It is achieved by embedded low cost transceivers into the devices. It supports on the frequency band of 2.45GHz and can support upto 721KBps along with three voice channels.



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## CONCLUSION

The purpose of this project was to design and build a working prototype monitoring and control system of Home Automatic appliances. It is our great pleasure that we have successfully completed our project which we dreamed of previously. This project gave us the opportunity to learn the functionality of the components used and also improve our knowledge on the working of Internet of things. Each device connected to other will make human lives much better and advance. This project gave us the experience in the field of Internet of Things and idea of microcontrollers and communication protocols.

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## APPENDIX

```
#include <Servo.h>

#define ServoPin 8

#define relay0 A0

#define relay2 A2

#define interval 1000

int red_light_pin= 11;

int green_light_pin= 10;

int blue_light_pin = 9;

Servo myservo;

int c = 0;

int m=0;

int n=0;

void setup()

{

    // put your setup code here, to run once:
```

---

```
myservo.attach(ServoPin);

Serial.begin(9600);

pinMode(relay0, OUTPUT);

pinMode(relay2, OUTPUT);

pinMode(red_light_pin, OUTPUT);

pinMode(green_light_pin, OUTPUT);

pinMode(blue_light_pin, OUTPUT);
}

char val;

int flag=0;

void loop()

{

    // put your main code here, to run repeatedly:

    if(Serial.available())

    {

        val=Serial.read();

        myservo.write(val);
```

---

```
if(val=='a')
{
    if(flag==0)
    {
        myservo.write(90);
        flag=1;
    }
    else if(flag==1)
    {
        myservo.write(0);
        flag=0;
    }
}

else if(val=='b')
{
    c++;
```

---

```
if (c == 0)

{

    digitalWrite(red_light_pin,LOW);

    digitalWrite(green_light_pin,LOW);

    digitalWrite(blue_light_pin,LOW);

}

else if (c == 1)

{

    digitalWrite(red_light_pin,HIGH);

    digitalWrite(green_light_pin,LOW);

    digitalWrite(blue_light_pin,LOW);

}

else if (c == 2)

{

    digitalWrite(red_light_pin,LOW);

    digitalWrite(green_light_pin,HIGH);

    digitalWrite(blue_light_pin,LOW);

}
```

---

```
else if (c == 3)
{
    digitalWrite(red_light_pin,LOW);
    digitalWrite(green_light_pin,LOW);
    digitalWrite(blue_light_pin,HIGH);
}

else if (c == 4)
{
    digitalWrite(red_light_pin,HIGH);
    digitalWrite(green_light_pin,LOW);
    digitalWrite(blue_light_pin,HIGH);
}

else if (c == 5)
{
    digitalWrite(red_light_pin,LOW);
    digitalWrite(green_light_pin,HIGH);
    digitalWrite(blue_light_pin,HIGH);
}
```

---

```
    else if (c == 6)
    {
        digitalWrite(red_light_pin,HIGH);
        digitalWrite(green_light_pin,HIGH);
        digitalWrite(blue_light_pin,LOW);
    }
    else if(c==7)
    {
        digitalWrite(red_light_pin,HIGH);
        digitalWrite(green_light_pin,HIGH);
        digitalWrite(blue_light_pin,HIGH);
    }

    else
    c=0;
    }

    else if(val=='c')
```

---

```
{  
  
  if(m==0)  
  
  {  
  
    digitalWrite(relay0, HIGH);  
  
    m=1;  
  
  }  
  
  else  
  
  {  
  
    digitalWrite(relay0, LOW);  
  
    m=0;  
  
  }  
  
}  
  
else if(val=='d')  
  
{  
  
  if(n==0)  
  
  {  
  
    digitalWrite(relay2, HIGH);  
  
    n=1;
```



---

```
}  
  
else  
  
{  
  
    digitalWrite(relay2, LOW);  
  
    n=0;  
  
}  
  
}  
  
else if(val=='e')  
  
{  
  
    myservo.write(0);  
  
    digitalWrite(red_light_pin,LOW);  
  
    digitalWrite(green_light_pin,LOW);  
  
    digitalWrite(blue_light_pin,LOW);  
  
    digitalWrite(relay0,LOW);  
  
    digitalWrite(relay2,LOW);  
  
}  
  
else if(val=='f')  
  
{
```

---

```
myservo.write(90);  
  
digitalWrite(red_light_pin,HIGH);  
  
digitalWrite(green_light_pin,HIGH);  
  
digitalWrite(blue_light_pin,HIGH);  
  
digitalWrite(relay0,HIGH);  
  
digitalWrite(relay2,HIGH);  
  
}  
  
}  
  
}
```