NEW HORIZON
COLLEGE OF ENGINEERING

(Accredited by NAAC with 'A' Grade Autonomous College affiliated to VTU by AICTE & ISO 9001:2008 Certified)
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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

MINI PROJECT

EXTERNAL REVIEW

PROJECT BY

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HOME AUTOMATION SYSTEM

USING BLUETOOTH

OBJECTIVE

We have built a HOME AUTOMATION SYSTEM using Bluetooth which controls home appliances with voice commands or text commands using an Android App.

INTRODUCTION

Home Automation with respect of Internet of Things is a way devices and appliances are connected together to provide a seamless control over the aspects of our home. It is using the information technology and control system so as to lessen the human efforts/work.

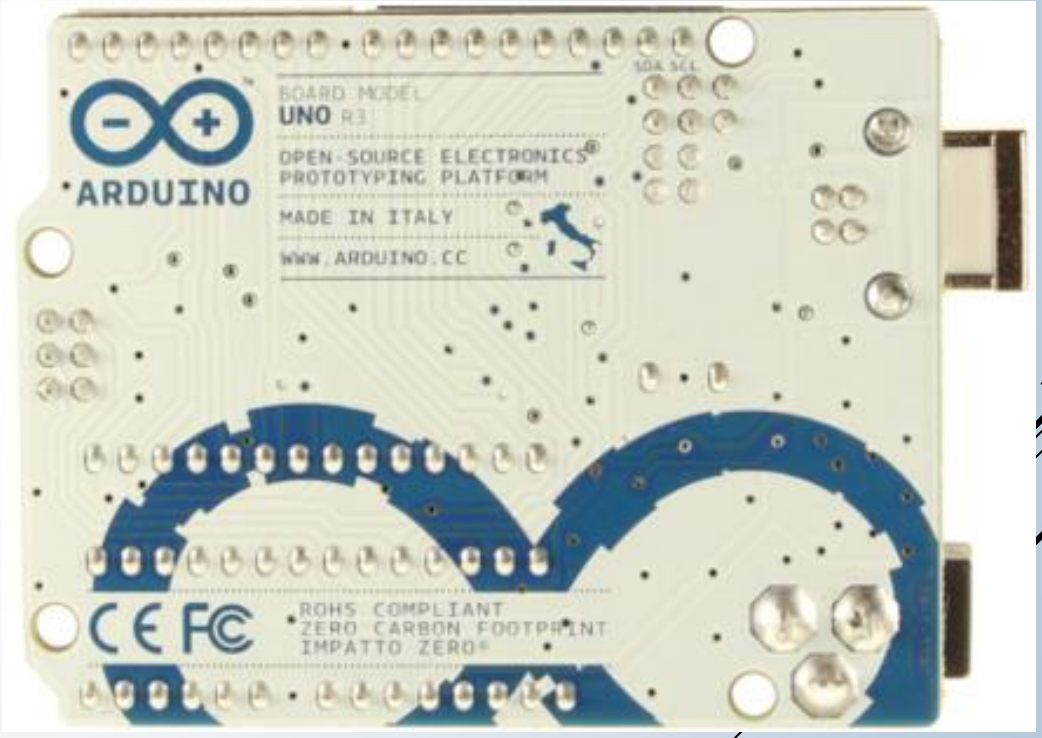
There are many types of Home Automation Systems like Bluetooth Controlled, Internet Controlled, RF Controlled, Remote Controlled (IR Remote) etc. Each type has its own advantages and disadvantages. In this project, we have designed a Voice Activated Home Automation system, where different appliances are controlled by sending a Voice Command/Text Command.

COMPONENTS USED

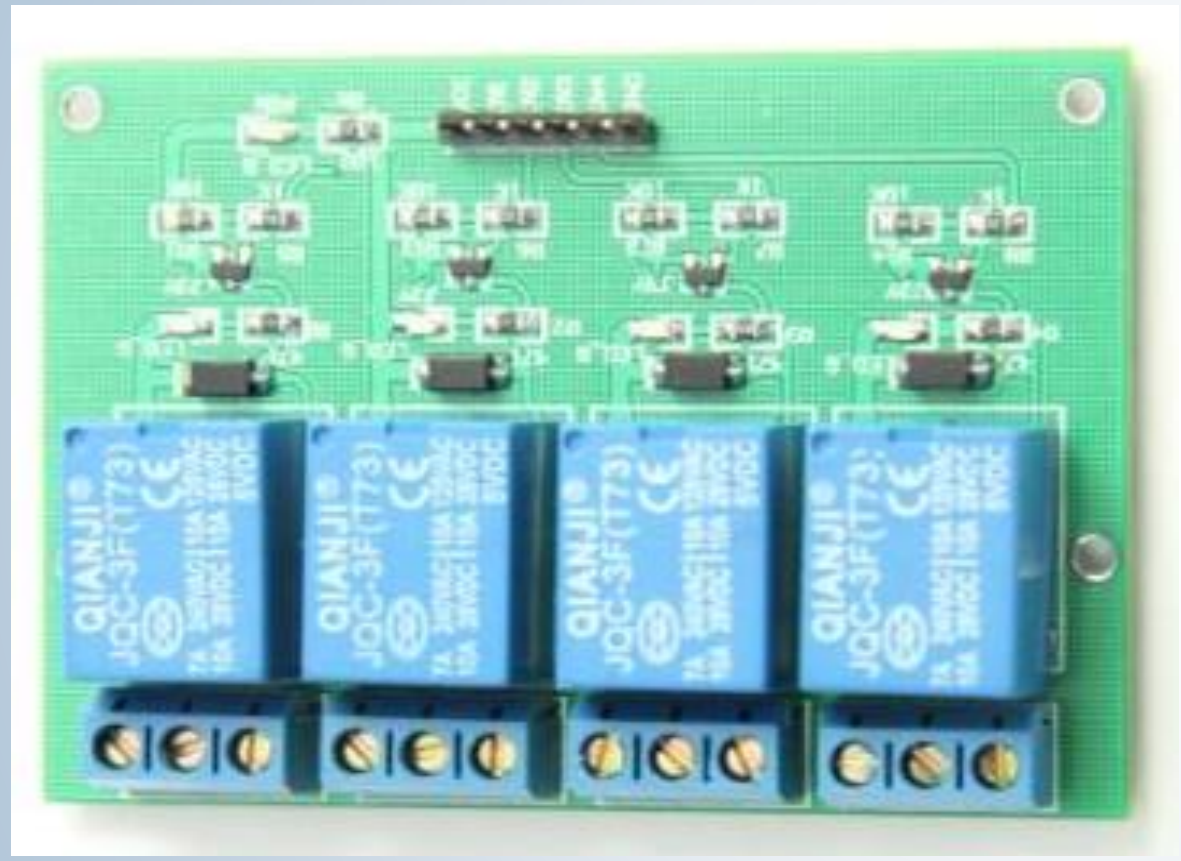
- ARDUINO UNO
- 4-CHANNEL RELAY MODULE
- HC-05 BLUETOOTH MODULE
- AC BULBS (BLUE & YELLOW)
- DC MOTOR
- BREAD BOARD
- JUMPER WIRES
- EXTENSION BOARD

ARDUINO UNO

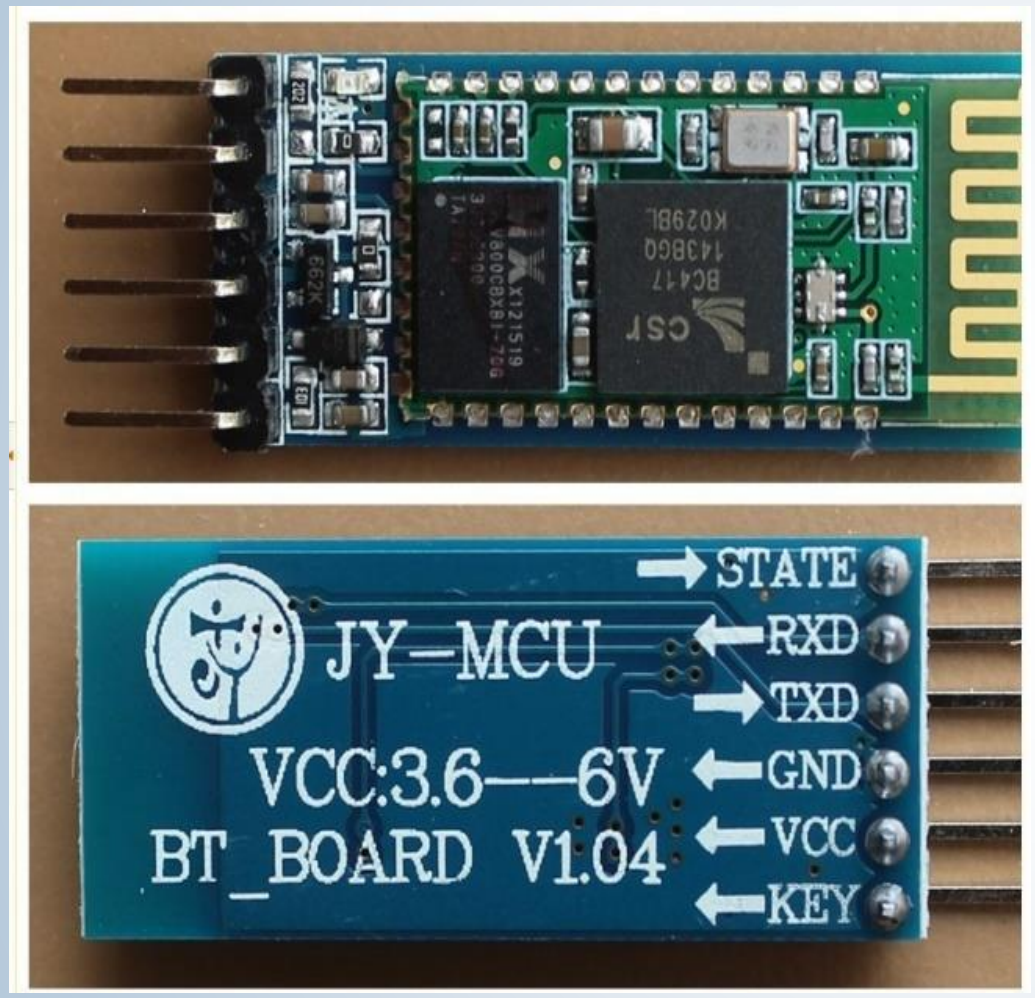

DIGITAL (PWM~)
UNO
ARDUINO
WWW.ARDUINO.CC – MADE IN ITALY
POWER
ANALOG IN


BOARD MODEL
UNO R3
OPEN-SOURCE ELECTRONICS PROTOTYPING PLATFORM
MADE IN ITALY
WWW.ARDUINO.CC
ARDUINO
ROHS COMPLIANT
ZERO CARBON FOOTPRINT
IMPATTO ZERO

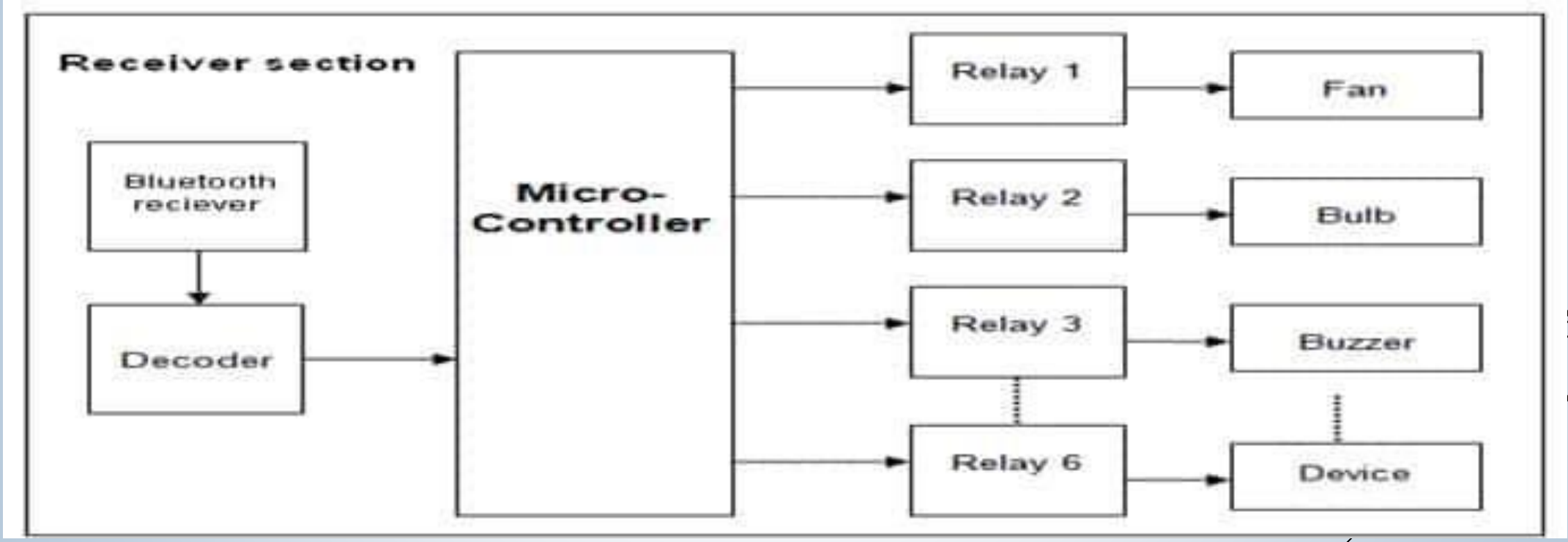
4-CHANNEL RELAY



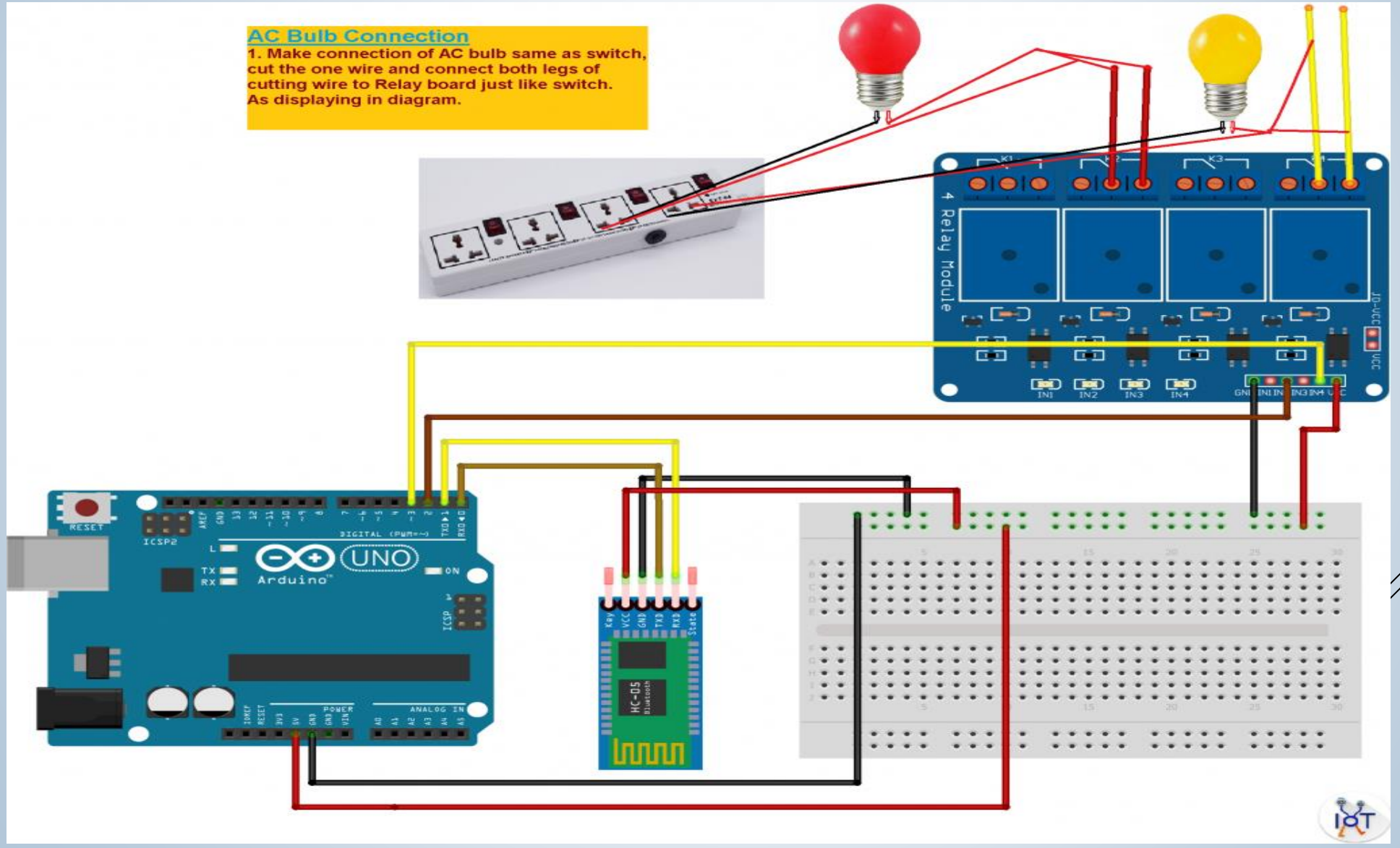
HC-05 BLUETOOTH MODULE



BLOCK DIAGRAM



CIRCUIT DIAGRAM



IMPLEMENTATION

- The Google Android Application and Google Play service is used as a voice to text converter if we want to send voice commands. For sending the text commands IoTBoys android application is used. The Bluetooth module is connected to the smartphone and that particular module is selected as the primary robot in the application for sending the voice or text commands. The commands are then given to the smartphone (application) which transmits the data to the HC-05 module.

- **The Bluetooth receiver in HC-05 module receives the data transmitted from the smartphone. Subsequently this data is processed through the ATmega328 microcontroller present in the Arduino UNO. The Arduino board have different output ports which are connected to different home appliances through the 4-channel relay board. This relay board acting as switches and switches the home appliances ON/OFF as per the data processed through the Atmega328 microcontroller. For testing purpose we are using 2 25W, 240V AC bulbs connected to AC mains supply and a 5V DC motor connected to a 9V high watt battery. The appliances switches ON/OFF as per the commands given by the user.**

OPERATIONS

Following actions can be done by giving voice/text commands:

- **Switch ON kitchen (blue) light.**
- **Switch ON bathroom (yellow) light.**
- **Switch ON all the lights at once.**
- **Switch ON the fan (motor).**
- **Switch ON all the appliances at once.**
- **Switch OFF any particular bulb.**
- **Switch OFF all the bulbs.**
- **Switch OFF the fan (motor).**
- **Switch OFF all the appliances.**

FUTURE SCOPE

- Automated systems are uniformly evolving these days in terms of ability, efficiency and overall performance. Home Automation systems are one of the most popular and in demand services in the world consumer markets.
- Some of the products in the market like Google Home, Amazon Alexa, Philips Hue bulbs are very popular among the consumers and are already selling at a very high rate in the market globally.
- Global home automation Market is expected to reach USD 79.57 billion by 2022 and USD 116.26 billion by 2026. The availability of home automations systems these days are due to other facts too like high powerful smartphones, availability of high speed internet connection, high range Bluetooth and Wi-Fi

APPLICATIONS

- Switch ON/OFF lights of other rooms from your mobile.
- You can control your Fans from your mobile.
- Control your door locks from mobile.
- You can control any AC appliance by the connecting the relay into the switch board.

ADVANTAGES

- Ideal for first-time configuration/pairing of device
- Suitable for short range controls (Instead of IR remote control that requires line of sight, Bluetooth works out better and doesn't need physically projecting sensor as like IR receiver)
- Secure, the module is password protected can be connected only by the genuine users.
- Very cheap as compared to other Automation System.
- Maintenance is easy and can be done quickly.

DISADVANTAGES

- Limited to Short distance (Range is 10-20m).
- Not suitable as a receiver, on battery based applications.
- Data Rate is low.
- Bluetooth no more in trend.
- If you want another user to join this system a whole lot of code and configuration is needed.

THANK YOU