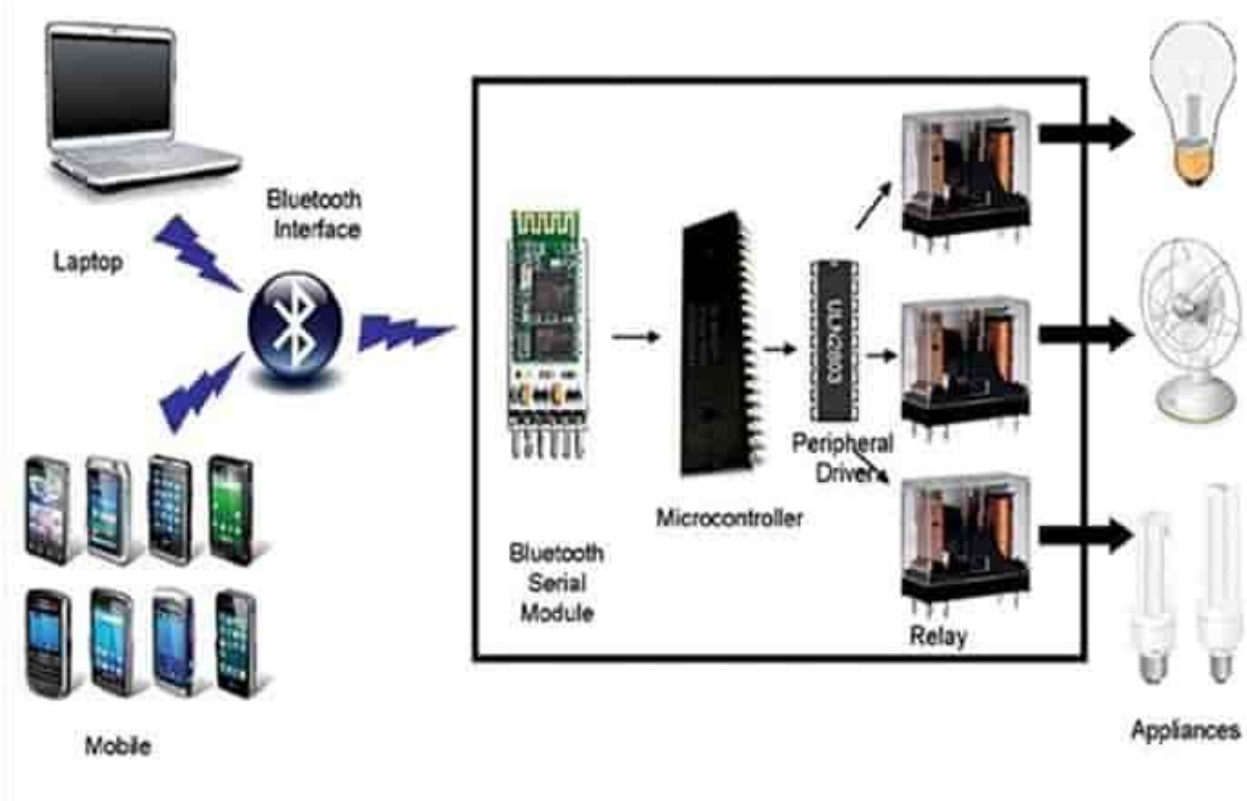
Arduino based Home Automation using Bluetooth

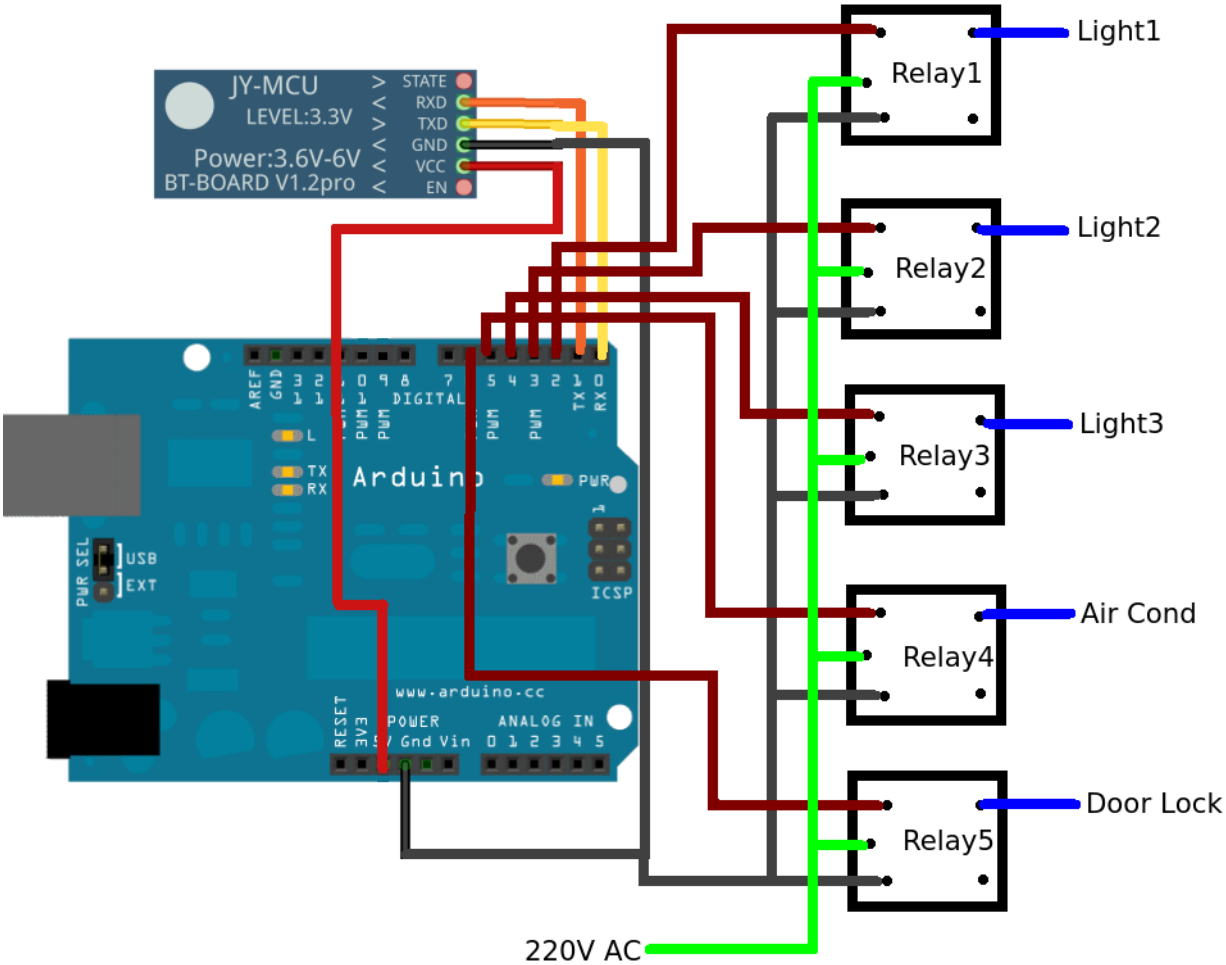
- *Description of the project*

Nowadays, people have smartphones with them all the time. So it makes sense to use these to control home appliances. Presented here is a home automation system using a simple Android app, which you can use to control electrical appliances with clicks or voice commands. Commands are sent via Bluetooth to Arduino Uno. So you need not get up to switch on or switch off the device while watching a movie or doing some work.



➢ *Circuit Diagram*

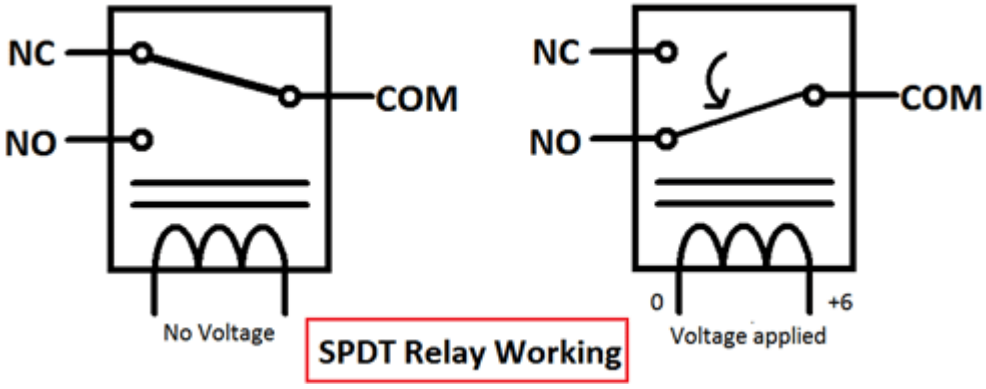
The home automation circuit is built around an Arduino Uno board, Bluetooth module HC-05 and a 3-channel relay board. The number of channels depends on the number of appliances you wish to control. Arduino Uno is powered with a 12V DC adaptor/power source. The relay module and Bluetooth module can be, in turn, powered using a board power supply of Arduino Uno. As shown in the figure.



➢ Relay module

A relay allows you to turn on or turn off a circuit using voltage and/or current much higher than what Arduino could handle. Relay provides complete isolation between the low-voltage circuit on Arduino side and the high-voltage side controlling the load. It gets

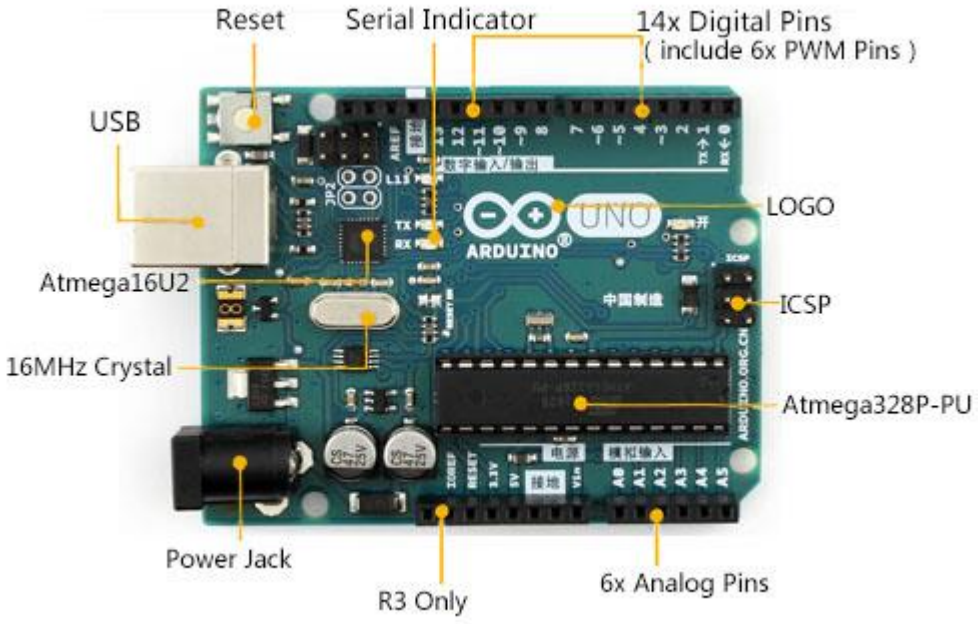
activated using 5V from Arduino, which, in turn, controls electrical appliances like fans, lights and air-conditioners.



➢ Arduino Uno board

Arduino Uno is based on ATmega328 microcontroller (MCU). It consists of 14 digital input/output pins, six analogue inputs, a USB connection for programming the onboard MCU, a power jack, an ICSP header and a reset button. It is operated with a 16MHz crystal oscillator and contains everything needed to support the MCU. It is very easy to use as you simply need to connect it to a computer using a USB cable, or power it with an AC-to-DC adaptor or battery to get started. The MCU onboard is programmed in Arduino programming language using Arduino IDE.

➢ Software



In this home automation project circuit, Pins 10 and 11 of Arduino are connected to pins T_{XD} and RXD of the Bluetooth module, respectively.

➢ Software

If you are new to Arduino, download the Arduino IDE (Integrated Development Environment)
from https://www.arduino.cc/en/main/software .

The Arduino code for the following project is in DIY_SmartHome file. The code is really simple. It checks the incoming Bluetooth signal via the Bluetooth module and then compares (ASCII values) using an "if" statement with previously defined values. If it matches the value, the relay is activated using the "digitalWrite(pin,HIGH)" command, which passes 5V to the Arduino digital pin.

➢ Anroid Software

We can use this android app to control the arduino.

https://play.google.com/store/apps/details?id=com.app.control&hl=en