# HOME AUTOMATION

## *How does it work?*

I have programmed a **Wemos D1 R1**, which is a Wi-Fi enabled development board, to perform interactions with electrical appliances instead of human interference. This concept goes along with our modern lifestyle as the interaction between the development board and appliances is exactly the same way how we interact with each other over the Internet. This concept, amongst programmable interfaces is known as the **Internet of Things** (**IOT**).

The basic function of the **Wemos D1 R1** is to receive instructions from the **"Google Assistant Cloud"** and then triggers assigned appliances over the Internet. There are many more connections involved in the process of transferring data. Some of these include **IFTTT** and **io.adafruit**. The appliances are triggered using Arduino-compatible electronic switches which are called relays. There will be a detailed description on the working of relays below.

## *What does IOT have to do with this?*

This way of using appliances is by just using your voice, which is recognized by the **Google Assistant**, which sends data over to the **Wemos D1 R1** using an internet connection. This is beneficial to older people as they can use this method, rather than a smartphone app, because elderly people are not comfortable with using smartphones.

This connection has a lot of processing involved, but its output is very beneficial. At first, when the **Google Assistant** recognizes your command, it will send over some data to a website called as **IFTTT**, which then saves data on a dashboard called io.adafruit. The **Wemos D1 R1** that is functioning in the background constantly keeps a check on this dashboard and as soon as it sees that the **IFTTT** website has posted data on the dashboard, it will trigger the assigned relay to be turned on or off. This service is called as **MQTT** and it is based on **IOT**. This may sound a bit complicated, but it's actually the same method we use to connect our devices to the world out there.

You can use these voice commands on any device that has **Google Assistant** on it and it can be even used on my "**Home Assistant**" part of this project. For example: Saying "Okay Google, turn on my living room light", will turn on your bedroom light.

## What are relays?

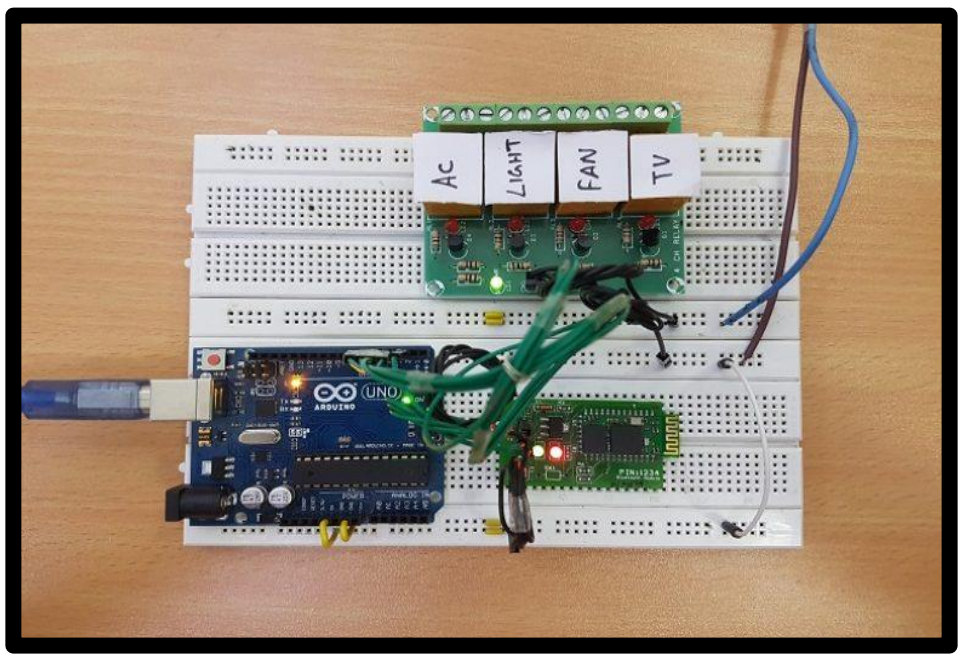
Relays are Arduino-Compatible electrical switches that have a basic function of completing a circuit. The only thing that separates a normal switch from a relay is that a normal switch needs to be turned on manually by hand. But a relay is turned on when an Arduino board sends a small voltage that turns on the relay and completes the circuit.

## What makes this part of this project beneficial?

With the arising issue of the wastage of energy resources, I made this model based on energy and electricity conservation, that will help the young, the old, the handicap and in general, everyone. With this project, one can control appliances with just his/her voice and an individual doesn't have to interface with switches anymore.

This is beneficial in many ways. For Example: If a man has left for office, and has left any appliance like a fan, light, AC or geyser on, there will be a lot of electricity that will be utilized and wasted. So I have designed a voice command which he can use to turn off all his appliances from where ever he is and thereby this will turn off the appliance that he left on and thus saves electricity. Another advantage of this is that before he enters his house and he wants his room cool, or his geyser water hot or maybe he wants his house water levels pumped up, he can put them on in advance, so as, when he comes home, the room will already be cool and the geyser water will already be hot and the water tank will already be filled up with water.

This system is also helpful for the old or handicapped, who aren't mobile. With the help of this project, the appliances around the house can be easily accessed and he/she can switch the appliances on and off with ease.



# HOME ASSISTANT

## How does it work?

I have programmed a **Raspberry Pi 3 B+** to run a **Software Development Kit (SDK)** which enables the functioning of a fully-fledged **Google Assistant**. The **Raspberry Pi** performs functions that enable it to recognize voice commands which then triggers the **"Google Assistant Cloud"** and gives accurate responses. It's an interactive addition to any home and is very useful as it can access multiple resources.

## What makes this part of this project beneficiary?

I've programmed it in such a way that the **Google Assistant** will always work in the background. **The Raspberry Pi** is actually a mini computer and it can be used just like a computer.

It is beneficial as it is more helpful than actually having to browse manually through books or google.com as the Assistant can give accurate answers within moments. It's a very handy and is an interactive addition to homes, as kids can use it for productive use. Definitions given from the assistant can be used by school going kids who can ask questions regarding topics which they want to know about in depth.