GOOGLE ASSISTANT CONTROLLED HOME AUTOMATION (IOT)

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Abstract:

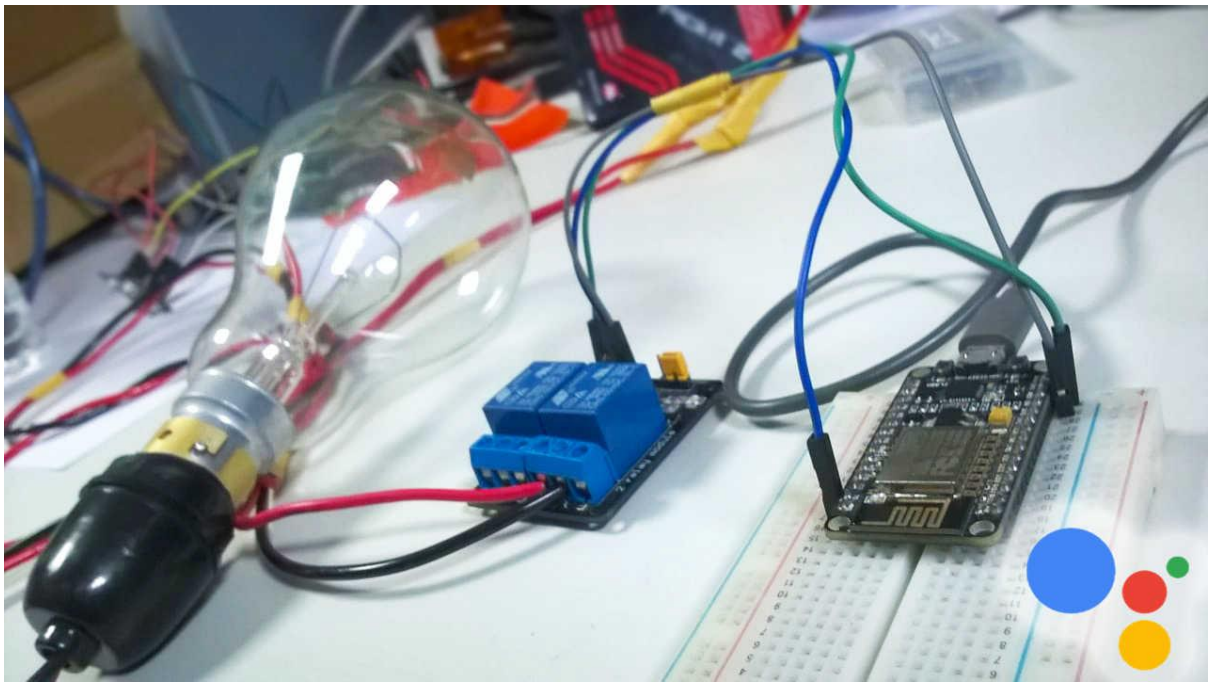
The idea behind Google assistant-controlled Home automation is to control home devices with voice. On the market there are many devices available to do that, but making our own is awesome. In this project, the Google assistant requires voice commands. Adafruit account which is a cloud based free IoT web server used to create virtual switches, is linking to IFTTT website abbreviated as “If This Than That” which is used to create if else conditional statements. The voice commands for Google assistant have been added through IFTTT website. In this home automation, as the user gives commands to the Google assistant, Home appliances like Bulb, Fan and Motor etc., can be controlled accordingly. The commands given through the Google assistant are decoded and then sent to the microcontroller, the microcontroller in turn control the relays connected to it. The device connected to the respective relay can be turned On or OFF as per the users request to the Google Assistant. The microcontroller used is NodeMCU (ESP8266) and the communication between the microcontroller and the application is established via Wi-Fi (Internet)

Introduction :

Google assistant is AI (Artificial Intelligence) based voice command service. Using voice, we can interact with google assistant and it can search on the internet, schedule events, set alarms, control appliances, etc.

This service is available on smartphones and Google Home devices.

We can control smart home devices including lights, switches, fans and thermostats using our Google Assistant.



We will build an application which can control home appliances. Here, we will control a 100W bulb using Google Assistant service.

This application includes Google assistant along with Adafruit server and IFTTT service.

Hardware Used

- NodeMCU – 32-bit ESP8266 development board with Wi-Fi SoC.
- Relay module
- Jumper and connecting wire.
- One 100 W Bulb

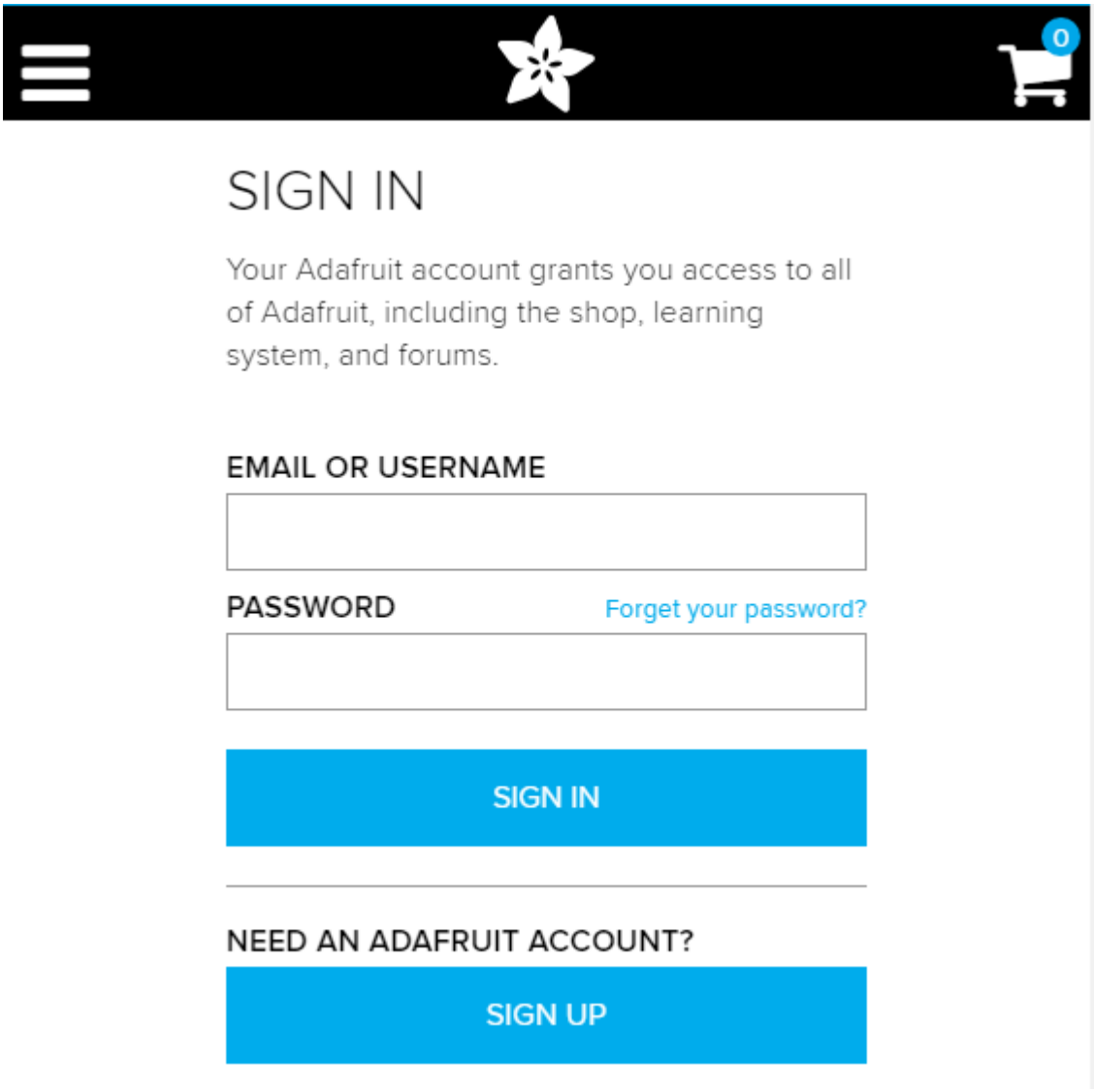
To build home automation application, I used three different platforms

- Google Assistant
- Adafruit
- IFTTT
- Arduino IDE

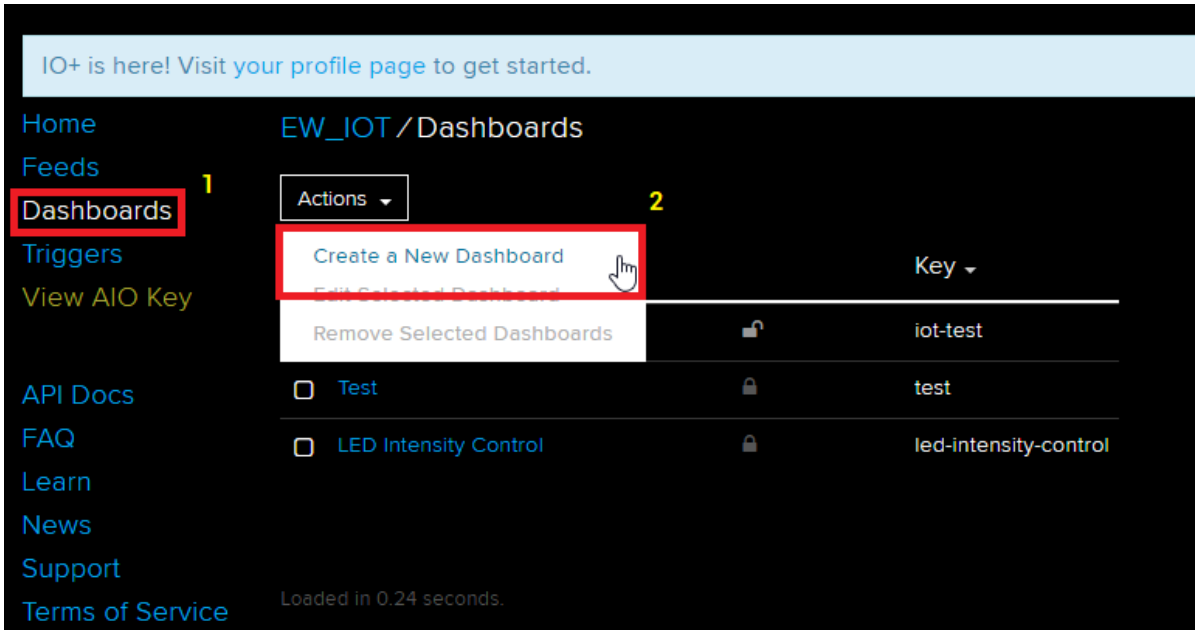
To use above services we need to configure them.

Adafruit

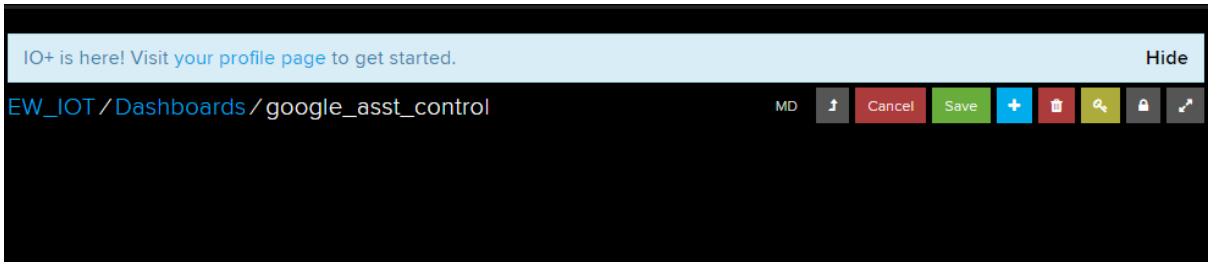
First, created account at www.Adafruit.io



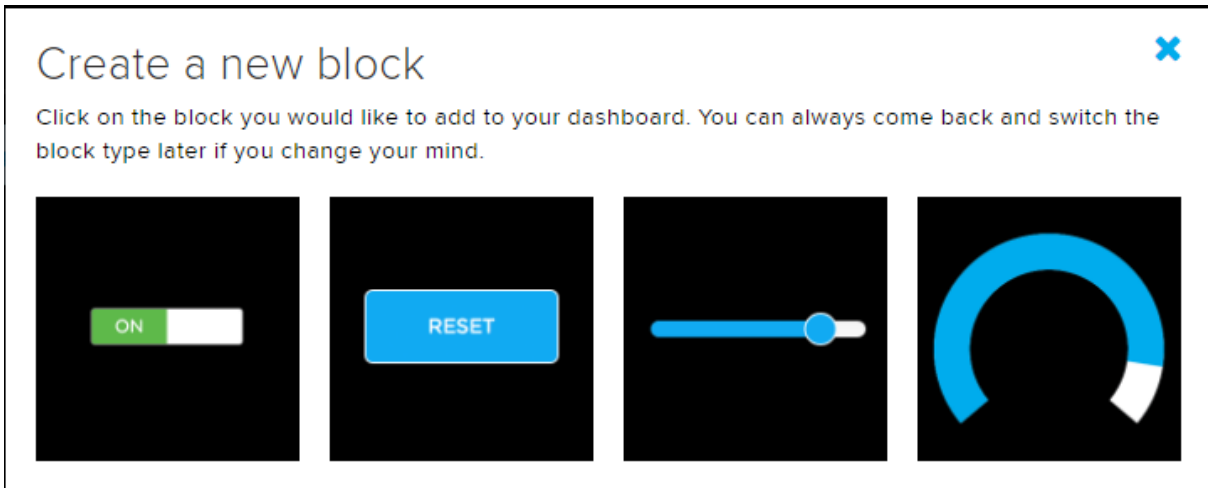
Now, create dashboard at Adafruit. This dashboard is a user interface to control things remotely.



After following above steps, provide name to the dashboard and save it. We can see our dashboard as follows,



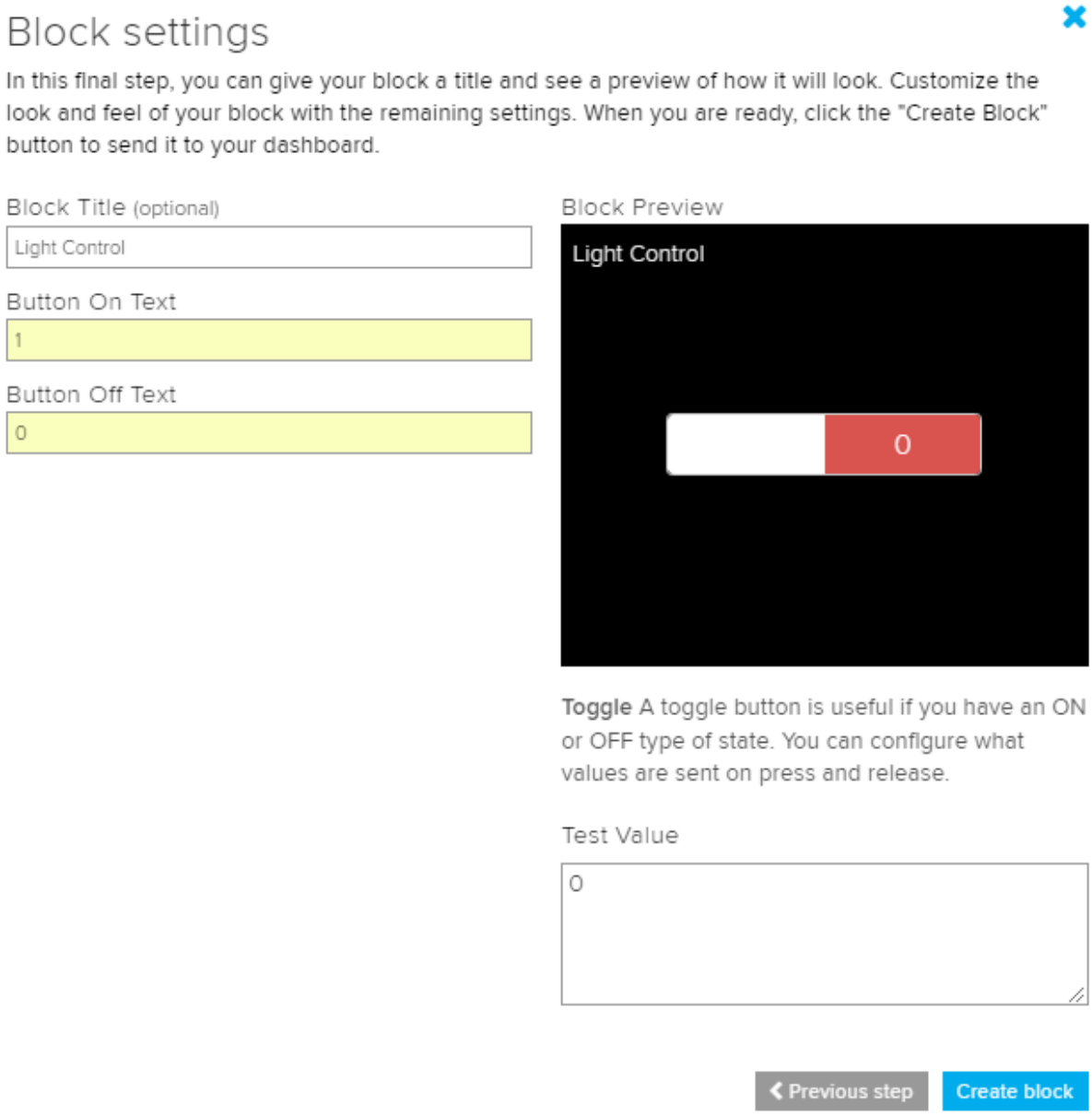
Now, create feed (user interface) to control light On-Off. To create it, just click on **'+'** symbol and select toggle feed shown below,



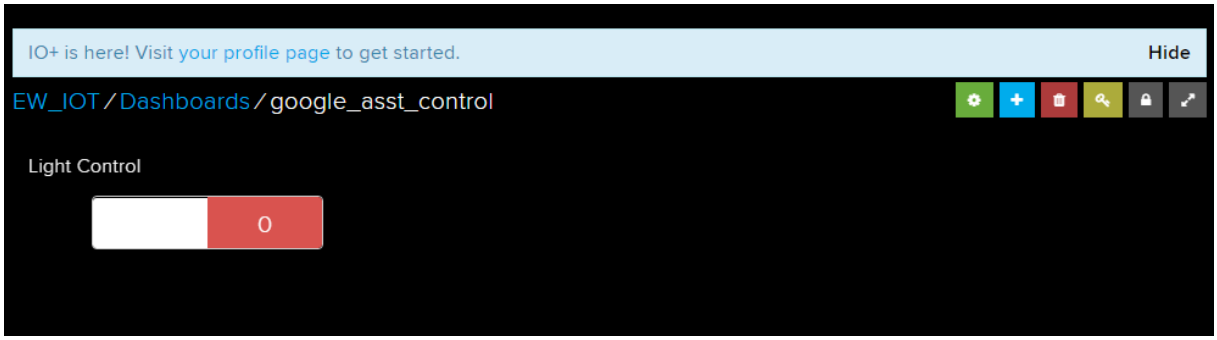
After selecting toggle feed

Enter name of our feed and create it. After creation, select the created feed and then click on **Next step.**

In the next step configure the feed which is shown below,



Here, I used **0**(OFF) and **1**(ON) text for button and then click on create. This will create toggle button on your dashboard which can be used to control things remotely.



Now, my dashboard is ready for IoT application like home automation.

IFTTT (If This Then That)

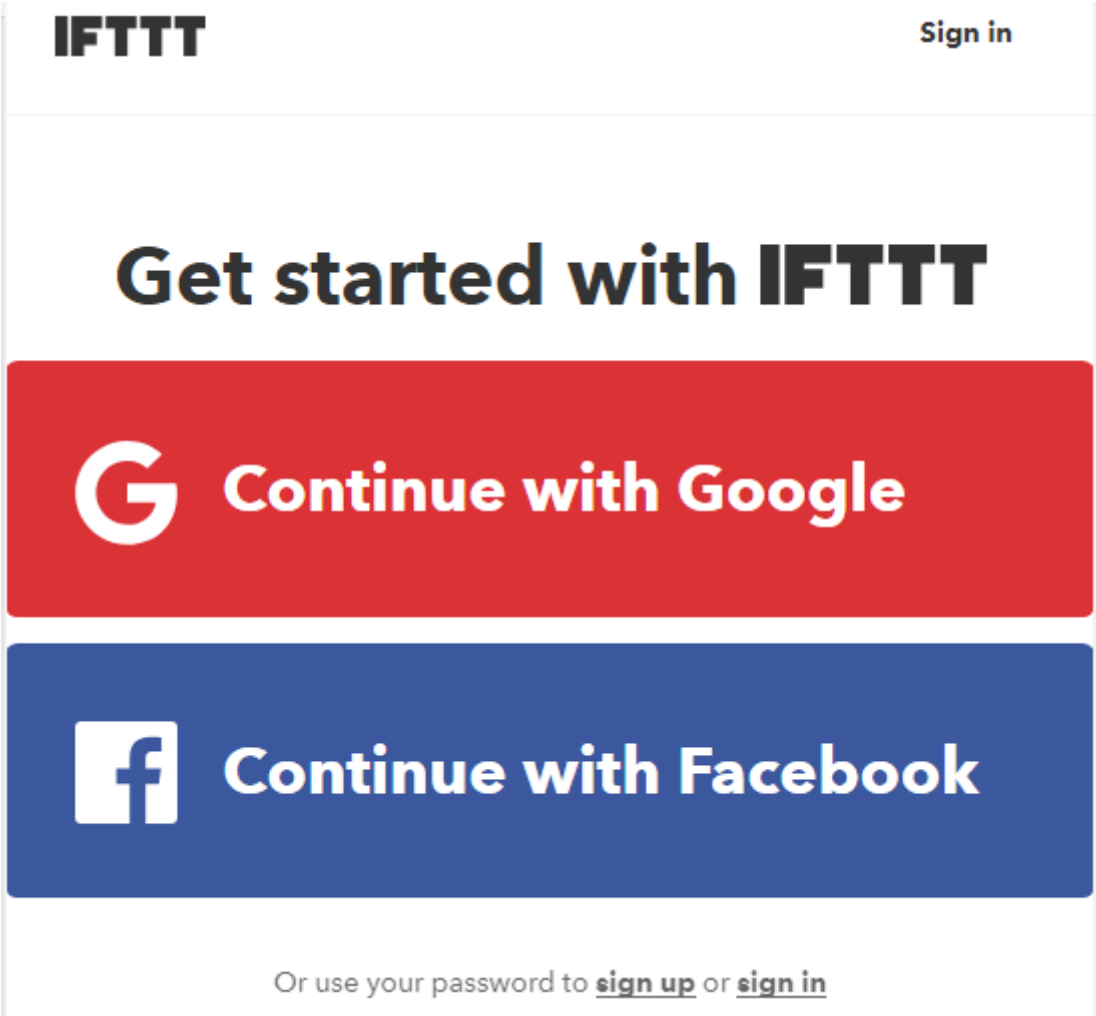
If This Then That, also known as IFTTT is a free web-based service to create chains of simple conditional statements, called applets. An applet is triggered by changes that occur within other web services such as Gmail, Facebook, Telegram, Instagram, or Pinterest.

For example, an applet may send an e-mail message if the user tweets using a hashtag or copy a photo on Facebook to a user's archive if someone tags a user in a photo.

Here, I used IFTTT to use google assistant service and Adafruit service in chain. So, when I use google assistant to control light of my home by saying Ok google, turn the light ON or OFF. Then IFTTT interpret the message and can send it to Adafruit's dashboard as a understandable command to the created feed.

Configure IFTTT

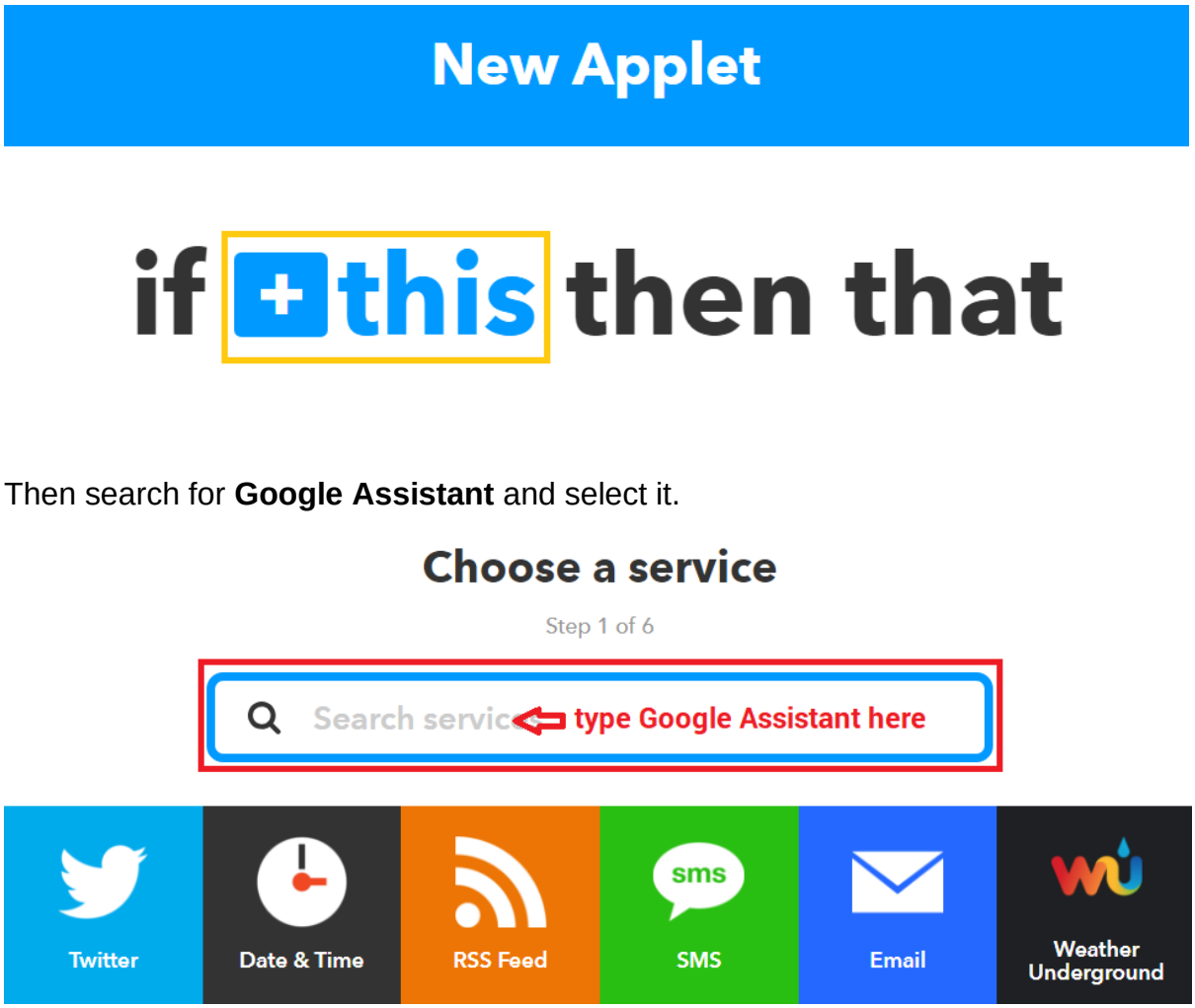
First step is creating account on IFTTT.



Note: Create account on IFTTT by using same e-mail id which you have used for Adafruit.

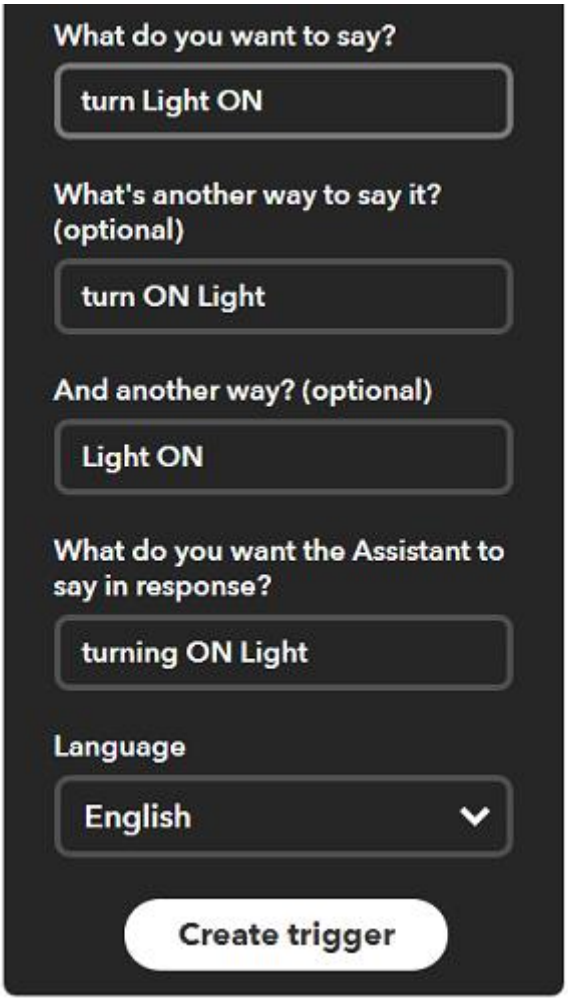
After account creation, click on **My Applets** and then select **New Applet** .

After selecting a new applet, we get a new page in which we should click on to **This** as shown in below image.



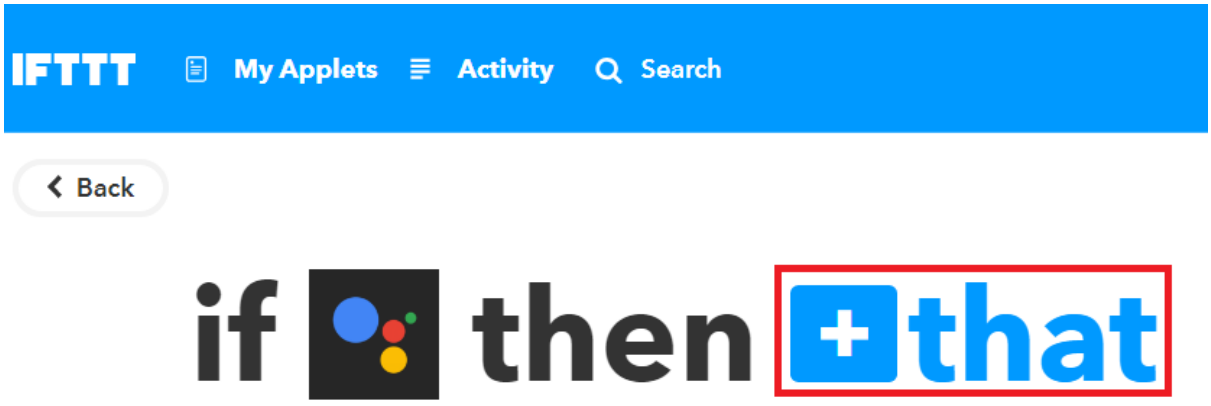
Then search for **Google Assistant** and select it.

Now, enter voice phrases which we will use as a command for google assistant.

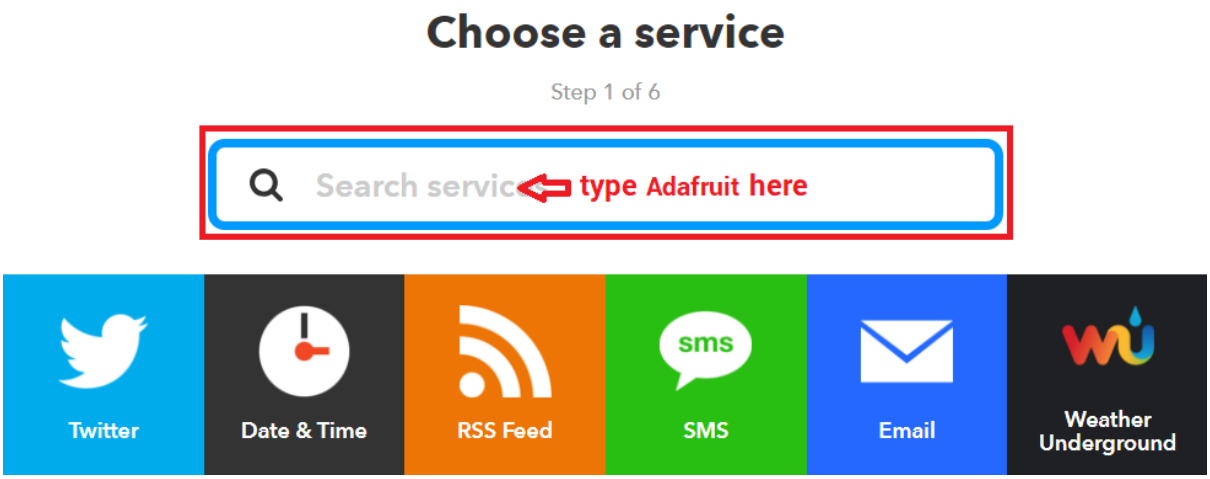


We can enter any phrase as per our application. As you can see, the phrases entered in the above fields is for making **Light ON.** For making **Light OFF**, we have to create another applet with different phrases.

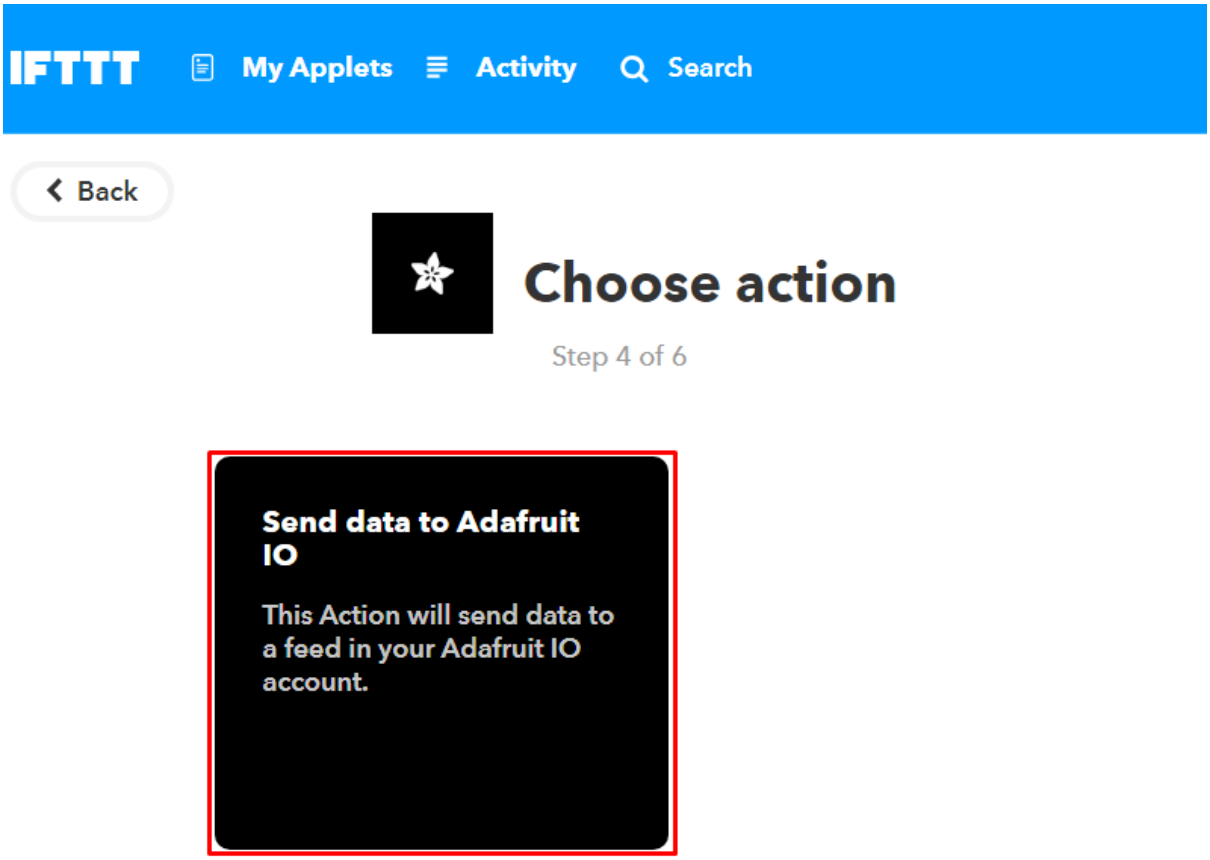
Now, we get another page on which we have to click on **that** option which is used to connect Google Assistant with Adafruit.



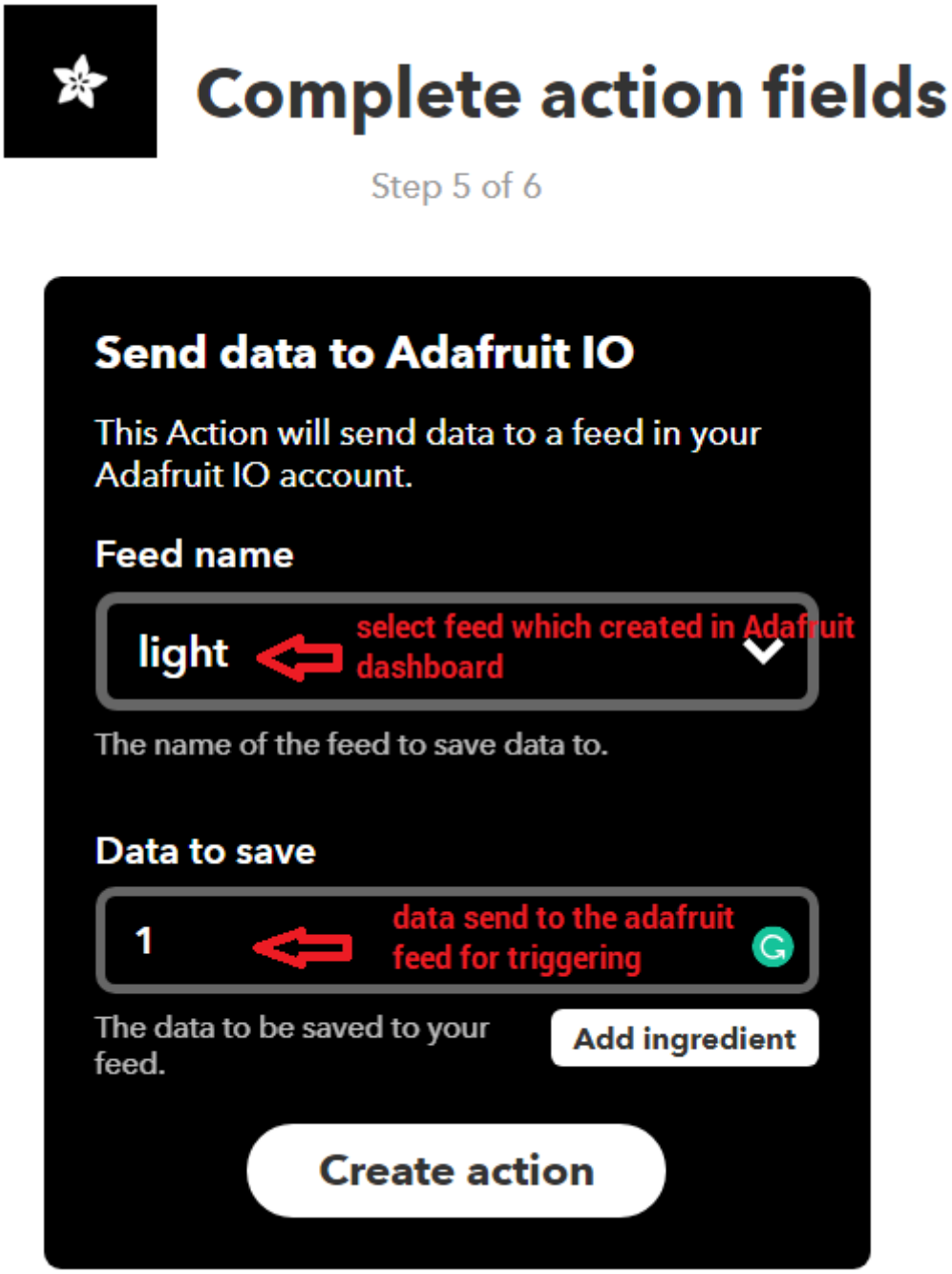
Then search for **Adafruit** and select it.



After selecting Adafruit, choose action as shown below,

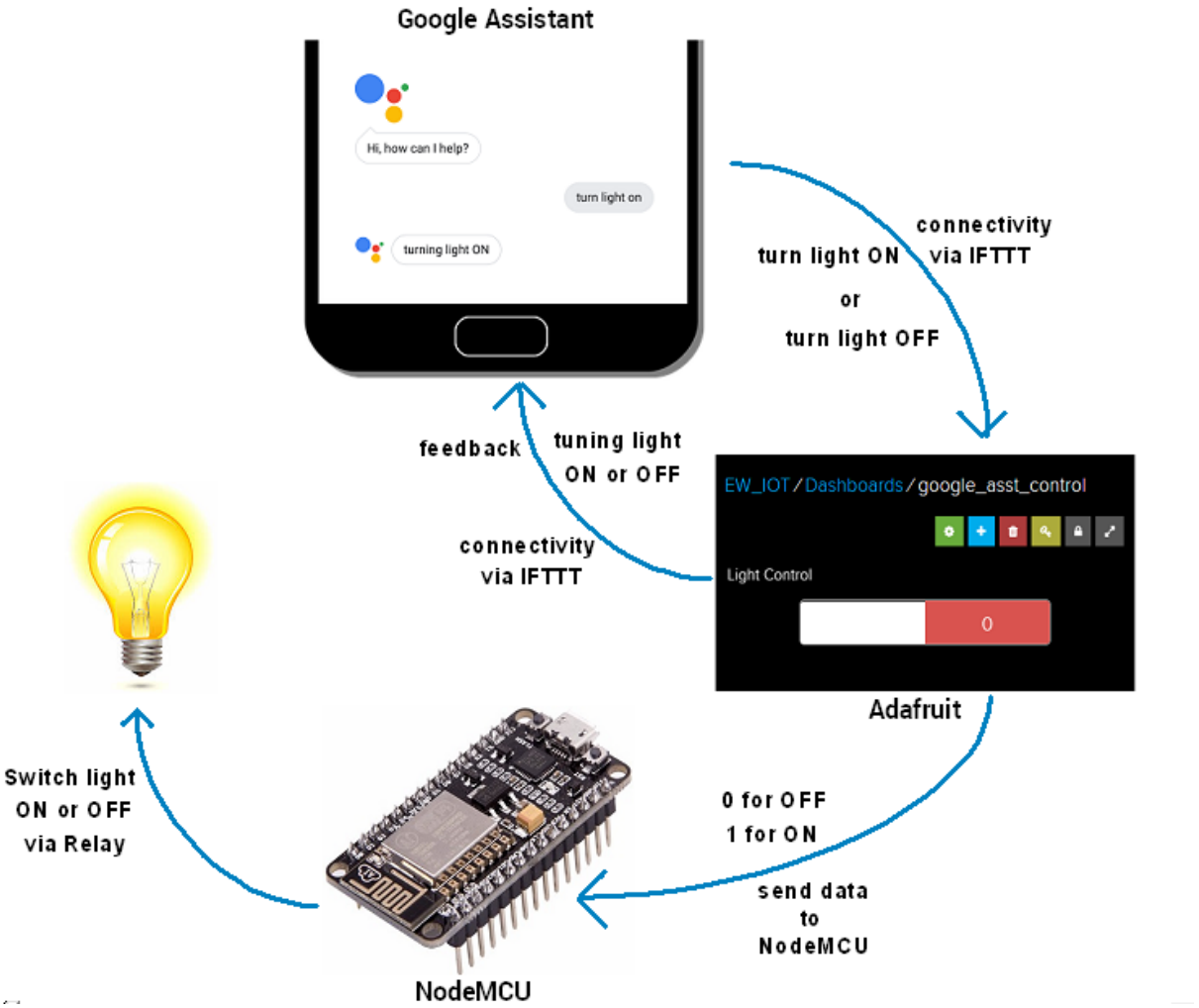


Now enter what data we need to send to which feed of Adafruit dashboard.

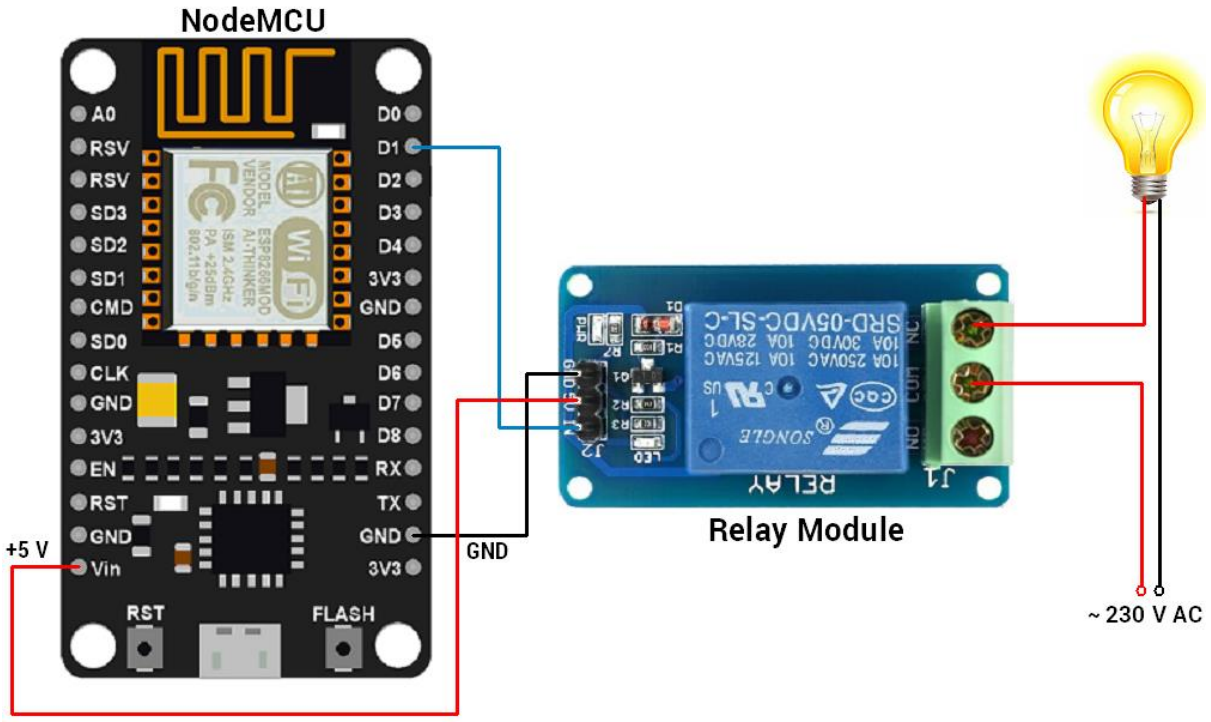


Click on **Create Action.**

So, when I use Google Assistant on my mobile and give voice command as “Ok Google, Turn LED ON”, applet created in IFTTT receive this command and will send data ‘1’ to the Adafruit feed. This will trigger the event on Adafruit dashboard which is continuously monitored by the microcontroller (here NodeMCU). This microcontroller will take action as per the data change on the Adafruit dashboard.



Interfacing Diagram



Control Home's Light using Google Assistant and NodeMCU

I build an IoT based home automation application in which I control the 100 W bulb at remotely using AI based Google Assistant.

Here, I used NodeMCU to read data from Adafruit server and act accordingly. 100 W bulb connected to NodeMCU via relay for controlling it voice command using google assistant.

PROGRAM:

The program code is in GitHub please check .The code is available on GitHub .

The GitHub Account Repository is given below.

https://github.com/samanta9/SOUVIK-SAMANTA-HOME-AUTOMATION.git

APPLICATIONS :

- Lighting control system
- Appliance control with a smart grid
- Indoor positioning systems
- Home automation for elderly and disabled people

FUTURE WORK :

There are a variety of enhancements that could be made to this system to achieve greater a ccuracy in sensing and detection.

a) There are a lot of other sensors that can be used to increase the security and control of th e home like pressure sensor that can be put outside the home to detect that someone will e nter the home.

b) Changing the way of the automated notifications by using the GSM module to make this system more professional

Conclusion:

According to this system, a smart voice control home automation system is deployed into the Nodemcu ESP8266 using IFTTT website and Google assistance API within it. Through which a user can control home appliances just by giving the voice commands input.

THANK YOU