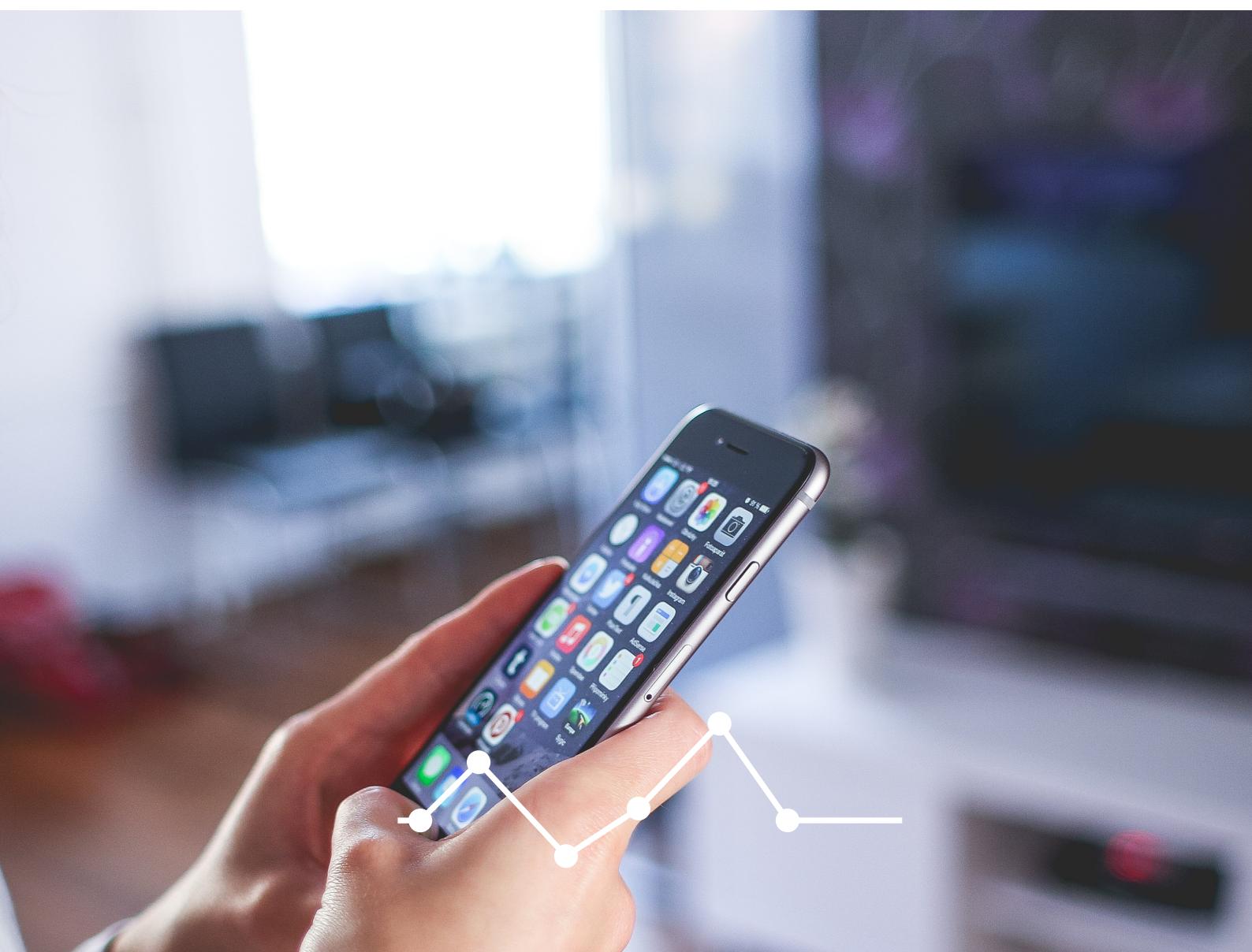


Home Automation using NodeMCU Mini Project Report



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ABSTRACT



- IoT based home automation project is done using NodeMCU ESP8266 WiFi Module, It uses relays and few other components,
- We can control many home appliances at once as per our need using the relay board
- We can control our home appliances connected to the nodeMCU using Blynk app or through voice commands using Google assistant app/ siri in android/ ios mobile phone.

Project Aim

The aim of the project is to design a home automation system that will remotely switch on/off any household appliances connected to it, using an app or through Google assistant with the help of NodeMCU using WiFi connectivity

What was the inspiration

Besides the convenience of being able to remotely control the home appliances like we can turn our a.c. on before getting home so as to have our room temp. lowered after the day's work and also being energy efficient. Remote monitoring can put our mind at ease while we're away from the house. With remote dashboards, lights and lamps can be turned on and off, and automated blinds can be raised and lowered. These capabilities can help to mitigate the risks of intrusions

Hardware required

- NodeMCU - ESP8266 wifi development board
- Relay Board(4 relay or 8 relay or even single relay may work depending on no. of appliances)
- Breadboard (may or may not be used)
- Breadboard Power supply / power bank/ battery (for power supply to the relay and NodeMCU)
- Jumper Wires
- Light bulb
- Wires you will address these issues the next time around.

Softwares required

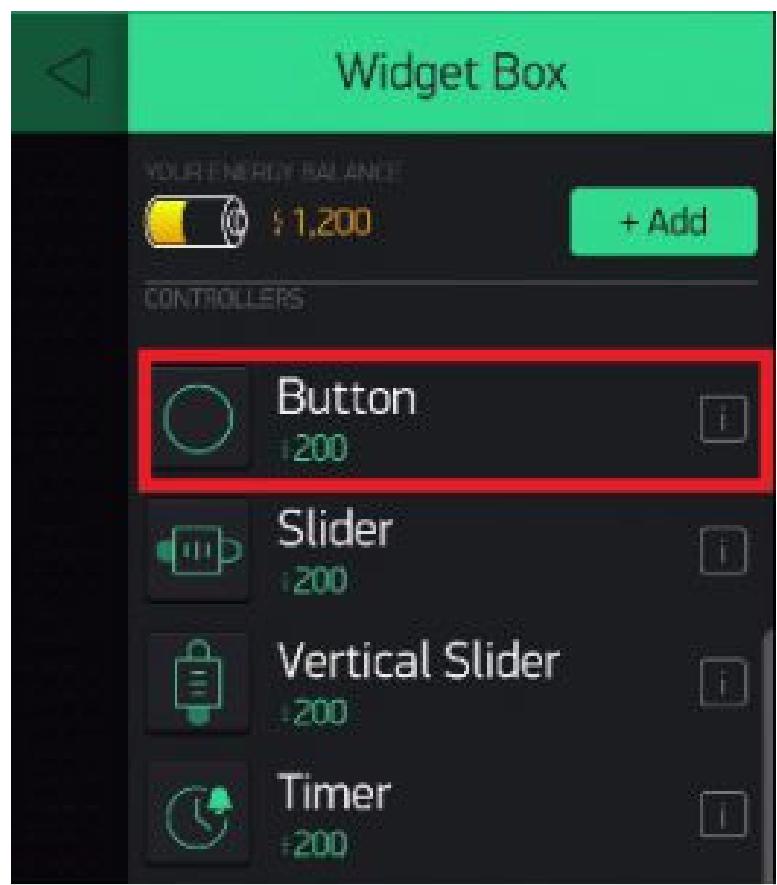
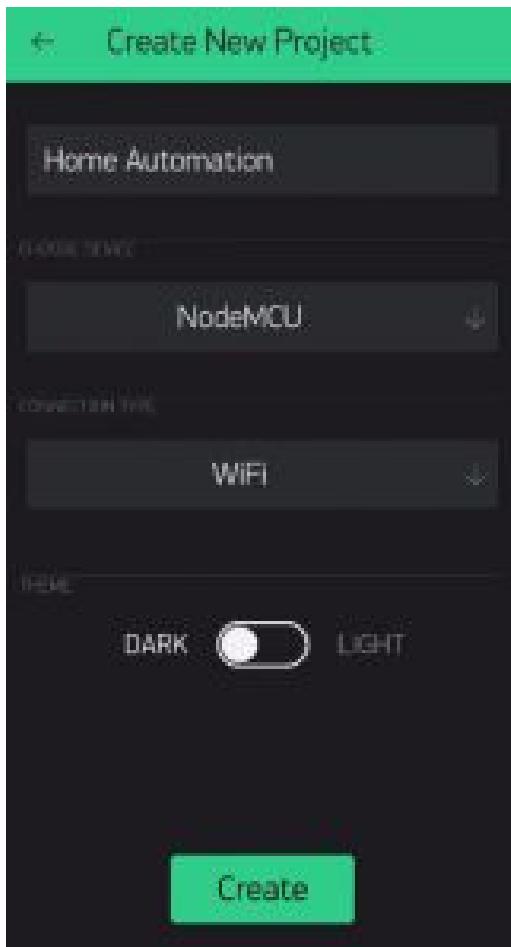
- Blynk app - Android/ ios
- Arduino IDE - Windows/ Linux/ Mac-os

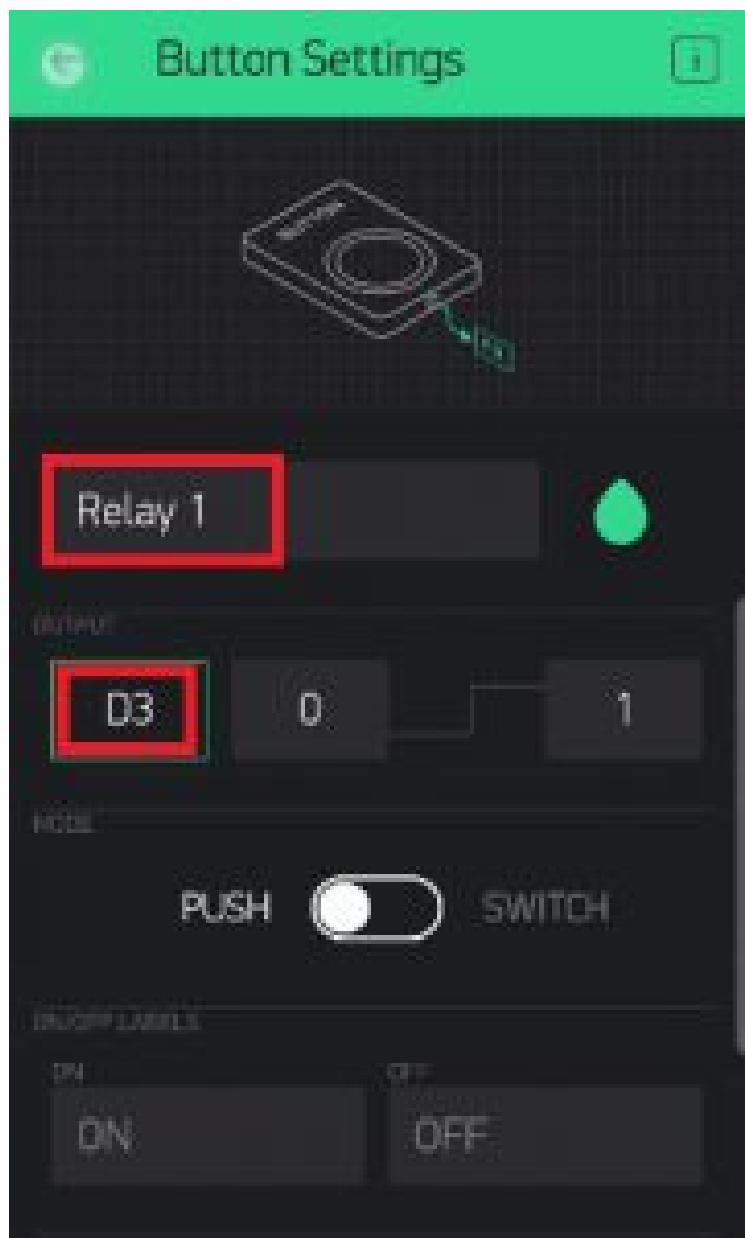
Design Procedure

- Configuring Blynk App
- Using Arduino IDE
- Hardware Assembly
- Using IFTTT

Configuring Blynk App

- Install the Blynk app
- Log in to the app and create a new project
- Give Project name
- Set hardware as NodeMCU
- Set connection as Wifi
- After creating a project, auth token will be given, which will be used in the code that will be uploaded to the nodemcu
- Depending upon the number of appliances we want to connect we will add that many number of buttons from the sidebar and place it on the blank area
- Click on the button, and then we can set its pin, name and the initial state of the pin when nodemcu starts



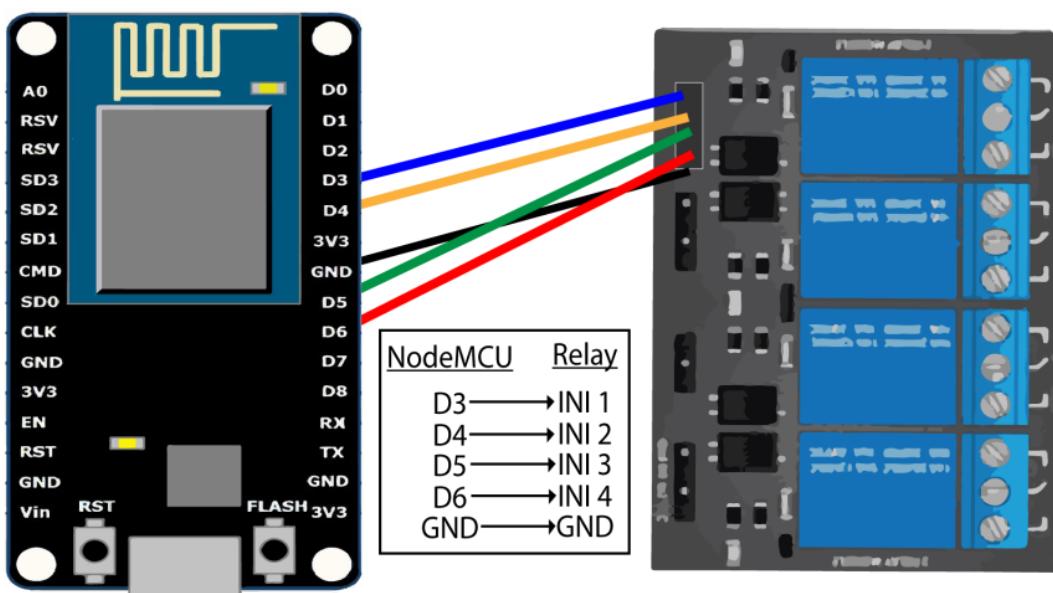


UPLOADING THE CODE

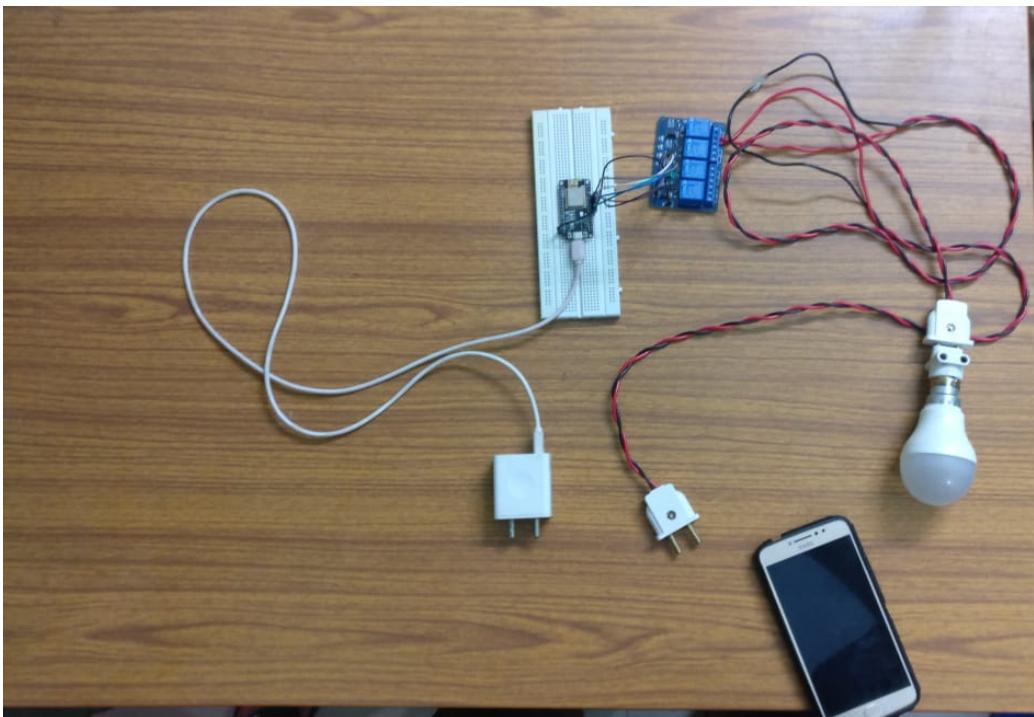
- We can write the code or we can take sample code from the Examples library of Arduino-IDE. Code that has been used is given with the report
- Enter the Auth token that was mailed during creating new project in blynk
- Enter the wifi name and password of the wifi to which nodemcu will connect
- Now we upload the code on to the nodemcu board

HARDWARE ASSEMBLY

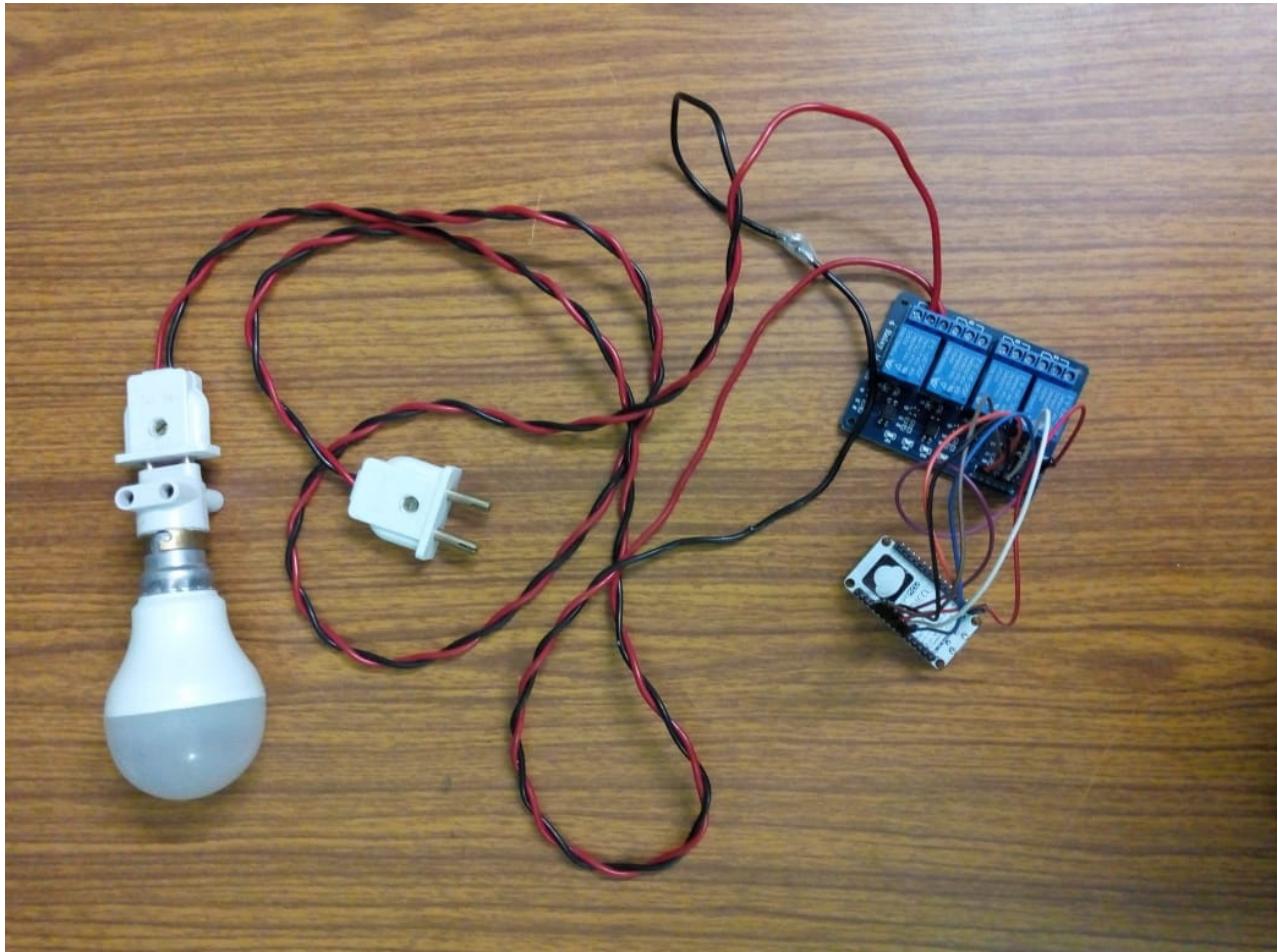
- Connect NodeMCU to Relay Board. We can directly connect them using jumper wires or use Breadboard for this
- NodeMCU has many input pins, we can connect IN1, IN2 ... depending on how many appliances we need to connect, of relay to anyone of those but we need to configure our buttons in Blynk app accordingly
- Connect ground pin of relay to GND of nodemcu, Vcc of relay to 3v3 of nodemcu, jdvc of relay to vin of nodemcu
- Power up NodeMCU using charger/ powerbank
- To power up Relay board we can use battery or breadboard power supply or can just use power supply from nodemcu



We can connect using Breadboard



or without using Breadboard



CONNECTING GOOGLE ASSISTANT USING IFTTT

- We have to go to the IFTTT website and create an applet that accomplishes this task for us where we set the voice command given to the google assistant app and the action related to it
- To create an applet we need to select app which we will use to customize as per our need. Here we will use Google assistant for using our own voice commands to control the nodemcu
- After entering voice commands i.e. the input to the google assistant we need to select what google assistant will do after it receives those commands
- We will use webhooks to send our commands to the blynk server
- Enter URL -
`http://188.166.206.43/"EnterAuthTokenHere"/update/"EnterDigitalPinToBeUpdateHere"`
- Blynk Server receives this command from IFTTT it assumes as if the command it received was to be sent to an 'Arduino Uno' board, but in our case, we are sending it to NodeMCU.
- To solve this, we must type the Digital pin of Arduino which corresponds with the NodeMCU

- Now, we select method as PUT and content type as Application/JSON
- Now, in body we need to specify what this applet will do, so when creating applet for turning on the relay/light/pin we will enter ["1"] and when creating applet for turning off the relay we will enter ["0"] and then click on create action
- Similarly we need to create applets for triggering a relay on and another applet for triggering a relay off for other relays if we want to control other appliances and set specific voice commands for that

The screenshot shows the IFTTT interface with the following details:

- Header:** IFTTT, My Applets, Activity, Search, nocreativeusernamefound
- Navigation:** Applets (selected), Services
- New Applet:** A button in the top right corner.
- Applets List:**
 - If You say "light off", then Make a web request**: Status: On, works with IFTTT
 - If You say "lights on", then Make a web request**: Status: On, works with IFTTT
- Footer:** About, Help, Jobs, Terms, Privacy, Trust, Build your own service and Applets, IFTTT Platform

you choose. For example, say "Ok Google, I'm running late" to text a family member that you're on your way home.

What do you want to say?

turn on relay one

What's another way to say it? (optional)

turn the first relay on

And another way? (optional)

turn on the first relay

What do you want the Assistant to say in response?

ok, turning on relay one

Create trigger

be rate limited.

URL

<http://188.166.206.43/979523.827af6/update/>

DO

Surround any text with "<<<" and ">>>" to escape the content

Add ingredient

Method

PUT

The method of the request e.g. GET, POST, DELETE

Content Type

application/json

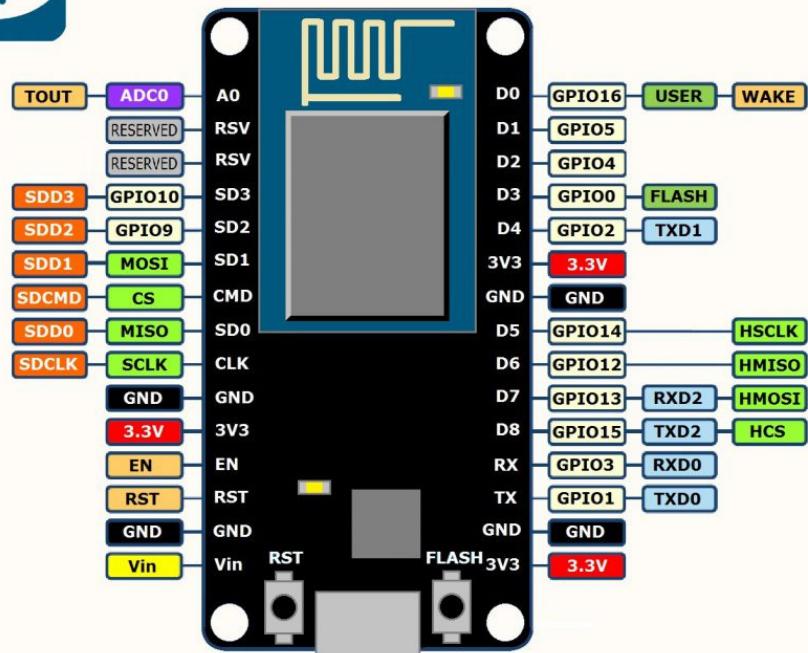
Optional

Body



NodeMCU ESP-12 development kit V1.0

PIN DEFINITION



RESULT

Project was able to control light connected to the relay through the blynk app on android and was also able to change the default on/off state of the connected appliance. Project was tested on different wifi by changing the wifi nodemcu connects to in the code uploaded to the nodemcu and light was successfully triggered on/off using personal voice commands set during ifttt applet design process.

FURTHER SCOPE OF IMPROVEMENTS

- There is an extreme scope of improvements and additions to the project
- Only 1 appliance(light bulb) was connected during this project, many such appliances can be connected with the help of 8 relay or 16 relay instead of 4 relay depending on the needs of the user
- As further appliances are connected to main power supply in households, office etc we will need help of professional electrician that can help with the wiring with the main so that we can control most of the home appliances with just the touch of the button on our phone
- We can also include many other assistants similar to google assistant like amazon alexa, bixby(recently introduced) to work with this project