INTRODUCTION :

What is an IOT device?

It’s a physical object that connects to the Internet. It can be a fitness tracker, a thermostat, a lock or appliance – even a light bulb.

Imagine shoes that track your heartbeat… and can flag potential health problems. You don’t have to imagine – these “smart” shoes already exist!

The field has evolved due to the convergence of multiple [technologies](https://en.wikipedia.org/wiki/Technologies), including [ubiquitous computing](https://en.wikipedia.org/wiki/Ubiquitous_computing), [commodity](https://en.wikipedia.org/wiki/Commodity) [sensors](https://en.wikipedia.org/wiki/Sensors), increasingly powerful [embedded systems](https://en.wikipedia.org/wiki/Embedded_system), as well as [machine learning](https://en.wikipedia.org/wiki/Machine_learning).Traditional fields of [embedded systems](https://en.wikipedia.org/wiki/Embedded_system), [wireless sensor networks](https://en.wikipedia.org/wiki/Wireless_sensor_network), control systems, [automation](https://en.wikipedia.org/wiki/Automation) (including [home](https://en.wikipedia.org/wiki/Home_automation) and [building automation](https://en.wikipedia.org/wiki/Building_automation)), independently and collectively enable the Internet of things. In the consumer market, IoT technology is most [synonymous](https://en.wikipedia.org/wiki/Synonymous_(disambiguation)) with products pertaining to the concept of the "[smart home](https://en.wikipedia.org/wiki/Smart_home_technology)", including devices and [appliances](https://en.wikipedia.org/wiki/Home_appliance) (such as lighting fixtures, [thermostats](https://en.wikipedia.org/wiki/Thermostats), home [security systems](https://en.wikipedia.org/wiki/Security_systems), cameras, and other home appliances) that support one or more common ecosystems, and can be controlled via devices associated with that ecosystem, such as [smartphones](https://en.wikipedia.org/wiki/Smartphone" \o "Smartphone) and [smart speakers](https://en.wikipedia.org/wiki/Smart_speaker). IOT is also used in [healthcare systems](https://en.wikipedia.org/wiki/Health_system).

There are a number of concerns about the risks in the growth of IOT technologies and products, especially in the areas of [privacy](https://en.wikipedia.org/wiki/Digital_privacy) and [security](https://en.wikipedia.org/wiki/Digital_security), and consequently, industry and governmental moves to address these concerns have begun, including the development of international and local standards, guidelines, and regulatory frameworks.

#### Home automation

IoT devices are a part of the larger concept of [home automation](https://en.wikipedia.org/wiki/Home_automation), which can include lighting, heating and air conditioning, media and security systems and camera systems. Long-term benefits could include energy savings by automatically ensuring lights and electronics are turned off or by making the residents in the home aware of usage.

A smart home or automated home could be based on a platform or hubs that control smart devices and appliances.For instance, using [Apple](https://en.wikipedia.org/wiki/Apple_Inc.)'s [HomeKit](https://en.wikipedia.org/wiki/HomeKit" \o "HomeKit), manufacturers can have their home products and accessories controlled by an application in [iOS](https://en.wikipedia.org/wiki/IOS" \o "IOS) devices such as the [iPhone](https://en.wikipedia.org/wiki/IPhone" \o "IPhone) and the [Apple Watch](https://en.wikipedia.org/wiki/Apple_Watch). This could be a dedicated app or iOS native applications such as [Siri](https://en.wikipedia.org/wiki/Siri" \o "Siri). This can be demonstrated in the case of Lenovo's Smart Home Essentials, which is a line of smart home devices that are controlled through Apple's Home app or Siri without the need for a Wi-Fi bridge.There are also dedicated smart home hubs that are offered as standalone platforms to connect different smart home products and these include the [Amazon Echo](https://en.wikipedia.org/wiki/Amazon_Echo), [Google Home](https://en.wikipedia.org/wiki/Google_Home), Apple's [HomePod](https://en.wikipedia.org/wiki/HomePod" \o "HomePod), and Samsung's [SmartThings Hub](https://en.wikipedia.org/wiki/SmartThings" \o "SmartThings).In addition to the commercial systems, there are many non-proprietary, open source ecosystems; including Home Assistant, OpenHAB and Domoticz.

# Internet Controlled LED Using NodeMCU by Voice command

The Internet of Things (IoT) is a system of interrelated computing devices, mechanical and digital machines, objects, animals or people that are provided with unique identifiers and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction.

In this instructable, we'll be making a simple IoT project.Web page controlled LED using NodeMCU connected on a local network.

Technologies used

* 1. Google Assistant

Google Assistant is a virtual assistant software application developed by Google that is primarily available on mobile and home automation devices. Based on artificial intelligence, Google Assistant can engage in two-way conversations



* 1. IFTTT

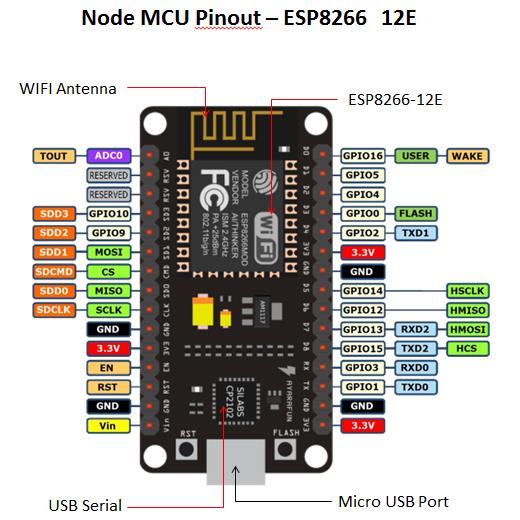
IFTTT is a private commercial company that runs online digital automation platforms which it offers as a service. Their platforms provide a visual interface for making cross-platform if statements to its users,

* 1. Thing Speak

ThingSpeak is **an IoT analytics platform service that allows you to aggregate, visualize, and analyze live data streams in the cloud**. You can send data to ThingSpeak™ from your devices, create instant visualizations of live data, and send alerts using web services like Twitter and Talkback

* 1. ESP8266 (Node MCU)

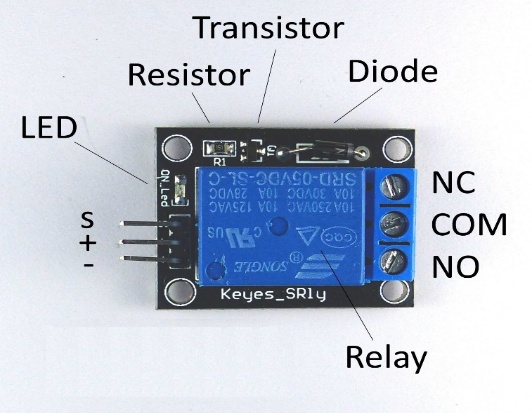
The ESP8266 WiFi Module is a self contained SOC with integrated TCP/IP protocol stack that can **give any microcontroller access to your WiFi network**. The ESP8266 is capable of either hosting an application or offloading all WiFi networking functions from another application processor.



* 1. ELECTRONIC COMPNENT
     1. Relay : Relays are electrically operated switches that **open and close the circuits by receiving electrical signals from outside sources**.

### ****5v 1 Channel Relay Module****

* Number of I/O Channels: 1
* Type: Digital
* Control signal: TTL level
* Max. Allowable Voltage: 250VAC/110VDC
* Max. Allowable Power Force: From C(800VAC/240W), From A(1200VA/300W)



* + 1. LED Bulb

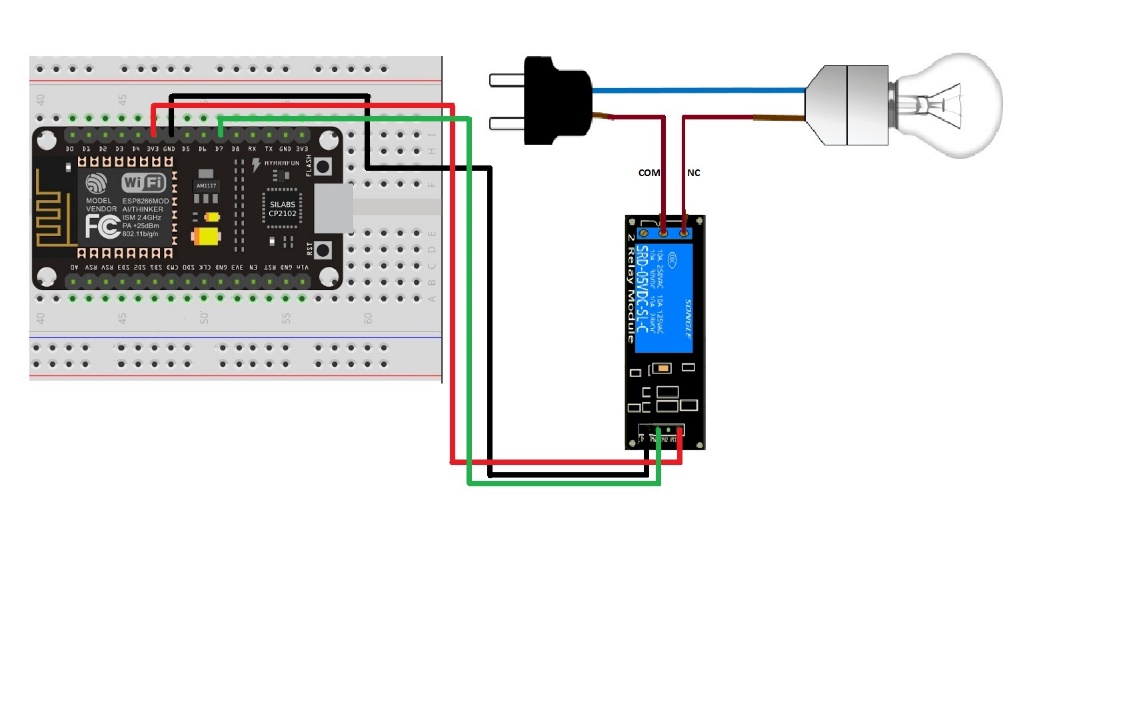
The light-emitting diode (LED) is today's most energy-efficient and rapidly-developing lighting technology. **Quality LED light bulbs last longer, are more durable, and offer comparable or better light quality than other types of lighting**.

* + 1. connection wires

1. jumper wires (female to female)
2. Cable wire
3. USB cable

CIRCUIT CONNECTION

* Attach NodeMCU on Breadboard.
* Connect VCC of Relay with Pin 3.3V of NodeMCU.
* Connect GND of Relay with GND of NodeMCU
* Connect Pin Signal of Relay with Pin D7 (GPIO 13) of NodeMCU
* Connect one terminal of Bulb (Blue Wire) with Pin NC (Normally Close) of Relay.
* Connect one terminal of Adapter with Pin C (Common) of Relay.
* Connect the other terminal of Bulb (Red Wire) with another terminal of Adapter.



CODE

#include "ThingSpeak.h"

#include <ESP8266WiFi.h>

#include <WiFiClient.h>

#include<ESP8266HTTPClient.h>

unsigned long channel = 1977448;

unsigned int led = 1;

const char \*ssid = "realme 6i"; // replace with your wifi ssid and wpa2 key

const char \*pass = "123456789";

WiFiClient client;

HTTPClient http;

void wificonnect(){

Serial.println("Connecting to ");

Serial.println(ssid);

WiFi.begin(ssid, pass);

while (WiFi.status() != WL\_CONNECTED)

{

delay(500);

Serial.print(".");

}

Serial.println("");

Serial.println("WiFi connected");

}

void setup()

{

Serial.begin(115200);

delay(10);

pinMode(D7, OUTPUT);

wificonnect();

ThingSpeak.begin(client);

}

void loop()

{

int led\_1 = ThingSpeak.readFloatField(channel, led);

//for relay we have to change value of led\_1 , 0 to 1 because opposite relay work

if(led\_1 == 0){

digitalWrite(D7, 1);

Serial.println("D1 is On..!");

}

else if(led\_1 == 1){

digitalWrite(D7, 0);

Serial.println("D1 is Off..!");

}

Serial.println(led\_1);

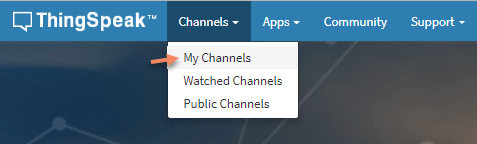
delay(5000); }

Connection with ‘ Thing speak ’

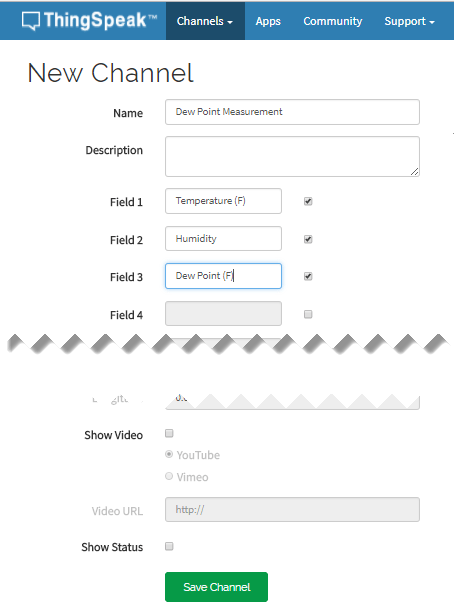
First of all we have to create an account on Thing speak website by signing in with an mail id (NOTE : we have to specific id , because we have use it in all different platform we are using in this project).

### Create a Channel

1. [Sign In](https://thingspeak.com/login) to ThingSpeak™ using your MathWorks® Account credentials, or create a new account.
2. Click **Channels** > **MyChannels**.



1. On the Channels page, click **New Channel**.
2. Check the boxes next to Fields 1–3. Enter these channel setting values:
   * **Name**: Dew Point Measurement
   * **Field 1**: Temperature (F)
   * **Field 2**: Humidity
   * **Field 3**: Dew Point



1. Click **Save Channel** at the bottom of the settings.

You now see these tabs:

* + **Private View**: This tab displays information about your channel that only you can see.
  + **Public View**: If you choose to make your channel publicly available, use this tab to display selected fields and channel visualizations.
  + **Channel Settings**: This tab shows all the channel options you set at creation. You can edit, clear, or delete the channel from this tab.
  + **Sharing**: This tab shows channel sharing options. You can set a channel as private, shared with everyone (public), or shared with specific users.
  + **API Keys**: This tab displays your channel API keys. Use the keys to read from and write to your channel.

# IFTTT: How to Create an Applet

Step 1 Download the app or login in ifttt website with same email id used in thing speak.

Step 2 press the button CREATE .

Step 3 click on the option “if this”(ADD)

Step 4 select trigger service as Google assistant .

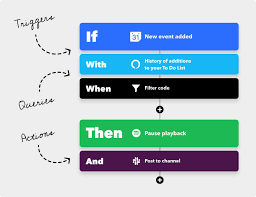
Step 5 Press ‘active scene’ write your voice commendation you want to give to the Google assistant .

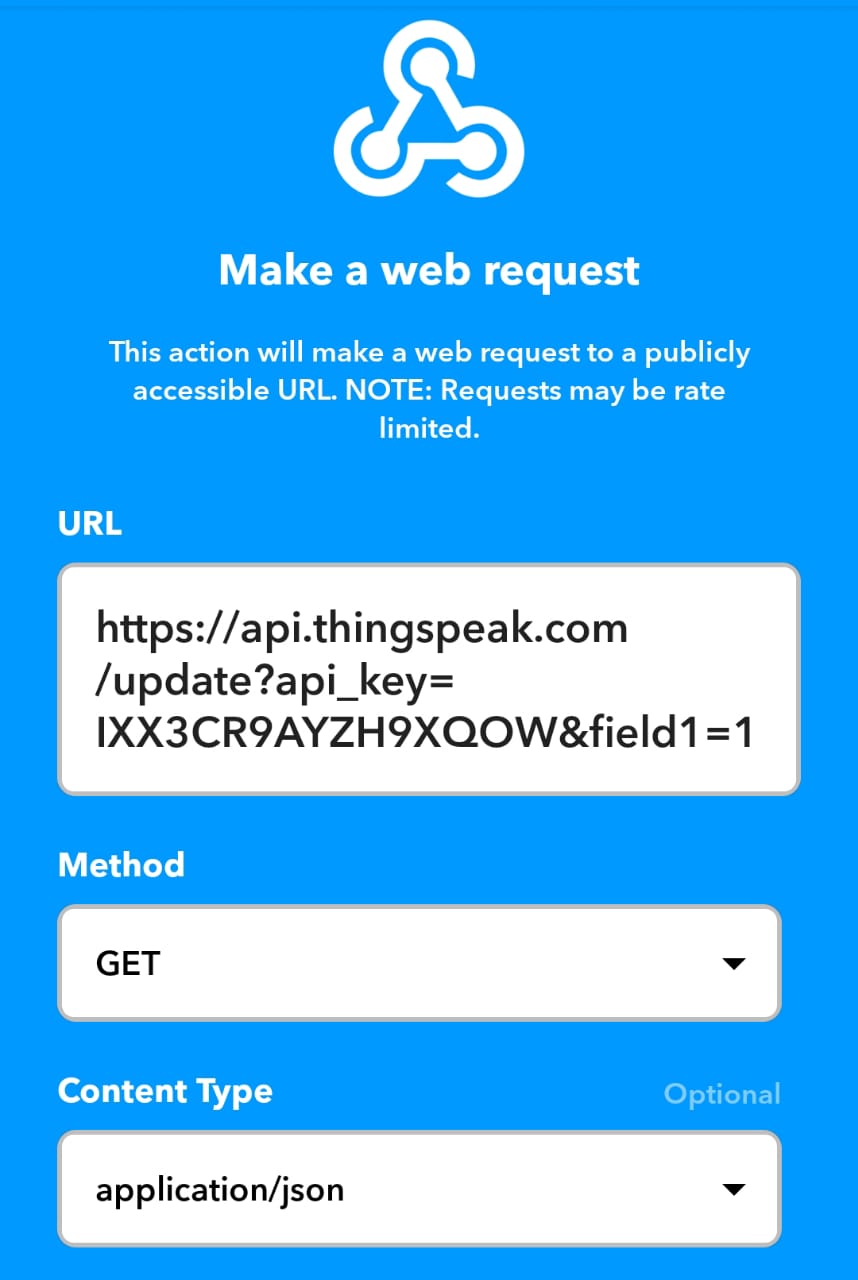
Step 6 click on option “then that”.

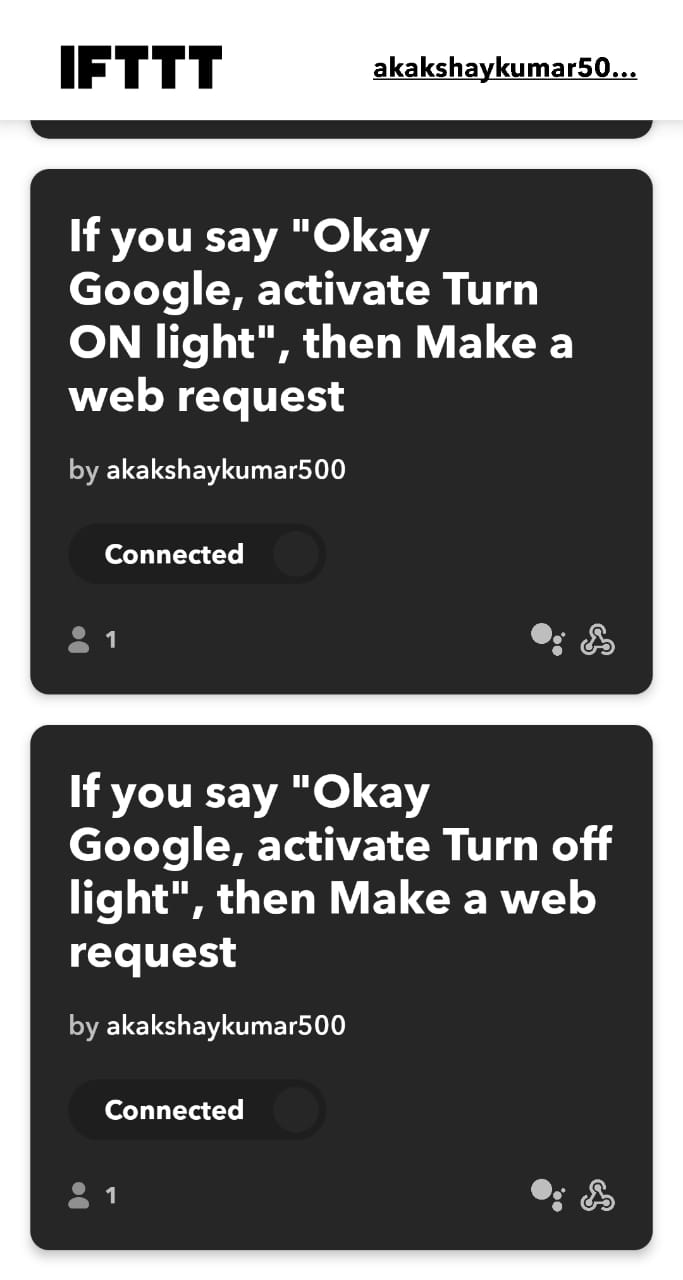
Step 7 search ‘webhooks”

Step 8 fill the URL , by giving correct channel id and field number .

Step 9 save the applet.







Connecting IFTTT with Google assistant

Step 1 Download Google home and Google assistant app.

Step 2 login with the same email id .

Step3 Click on setting button

Step 4 click on option ‘ work with Google’

Step 5 search IFTTT and click on link device .

Step 6 login on ‘Google Assistant’ app with same email id.

