Home Automation Light Blinking IoT Project

Introduction:

The Home Automation Light Blinking IoT project aims to control a light fixture voice control using an IoT (Internet of Things) approach. This project utilizes a Wi-Fi module, relay, IFTTT (If This Then That) platform.

Components:

1. **Wi-Fi Module**: A Wi-Fi module acts as a bridge between the light fixture and the internet. It enables wireless communication and connectivity.

2. **Relay**: A relay is an electrically operated switch that controls the power supply to the light fixture. It allows the Wi-Fi module to turn the light on or off remotely.

3. **IFTTT**: If This Then That (IFTTT) is a web-based service that allows you to create applets for various IoT devices and services. It acts as a mediator between different platforms and triggers actions based on predefined conditions.

Hardware Setup:

1. Connect the Wi-Fi module to our microcontroller or development board according to the manufacturer's instructions. Make sure it is properly powered.

2. Connect the relay to the Wi-Fi module and the light fixture. The relay should be capable of handling the power requirements of our light fixture.

3. Ensure that all the connections are secure and well-insulated to avoid any safety hazards.

Steps to Implement:

To blink an LED using IFTTT, ThingSpeak, Google Assistant, NodeMCU, and API, you'll need to set up the following components and follow the steps below:

Components:

NodeMCU or any other ESP8266-based development board.

LED connected to NodeMCU's GPIO pin.

Steps:

Set up ThingSpeak:

Create a ThingSpeak account at https://thingspeak.com.

Create a new ThingSpeak channel and note down the API key.

Set up IFTTT:

Create an IFTTT account at https://ifttt.com.

Connect IFTTT to Google Assistant and ThingSpeak using their respective services.

Create an applet with Google Assistant as the trigger and ThingSpeak as the action.

Configure the applet to update a specific field in your ThingSpeak channel when a specific phrase is spoken.

Set up the NodeMCU:

Install the Arduino IDE from https://www.arduino.cc/en/software.

Open the Arduino IDE and go to File -> Preferences.

Add the following URL to the Additional Boards Manager URLs: http://arduino.esp8266.com/stable/package_esp8266com_index.json

Go to Tools -> Board -> Boards Manager.

Search for "esp8266" and install the "esp8266" platform by ESP8266 Community.

Select the appropriate NodeMCU board from Tools -> Board menu.

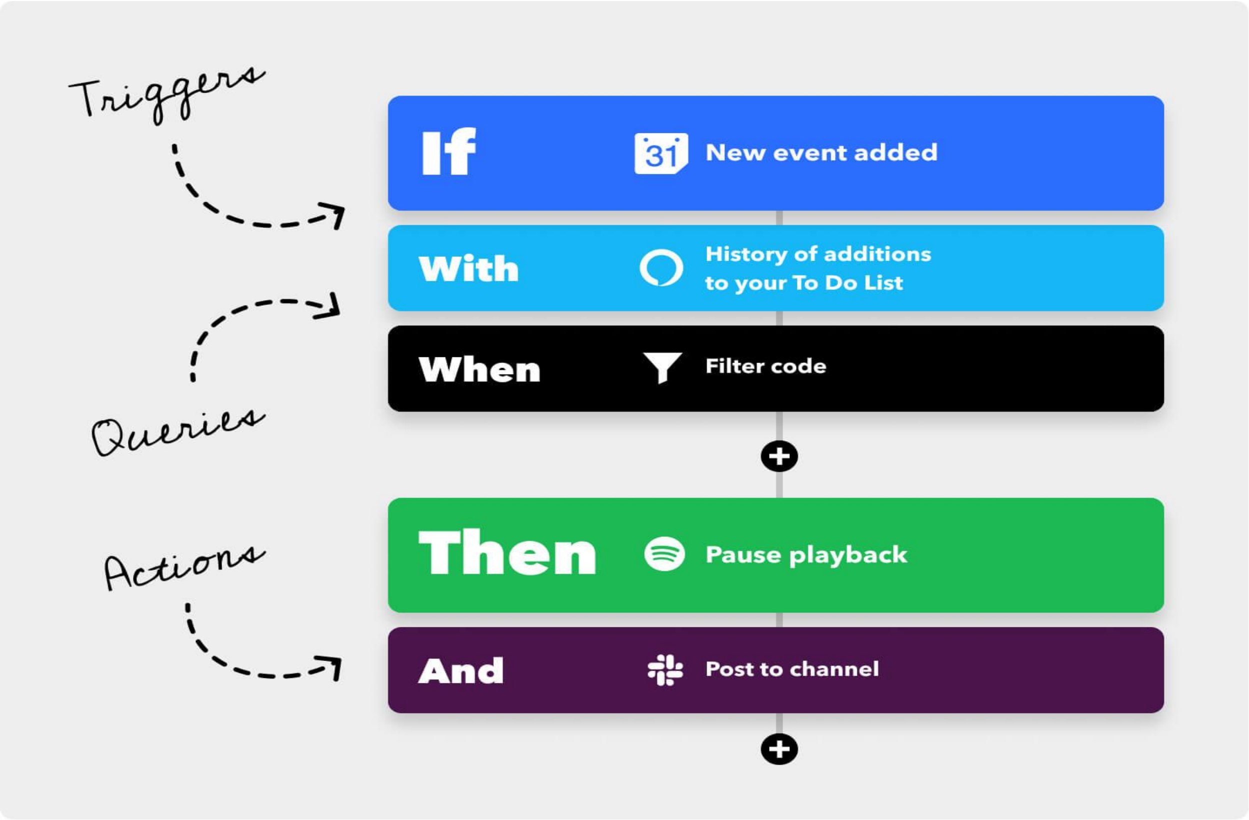
Install the necessary libraries:

"ESP8266WiFi" by ESP8266 Community

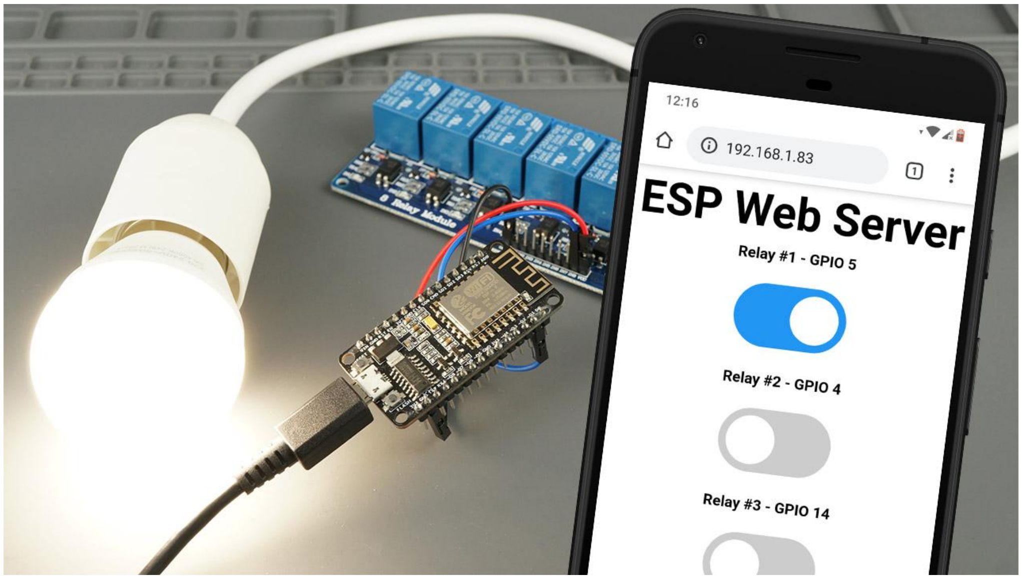
"ThingSpeak" by MathWorks

Connect the NodeMCU to your computer via USB.

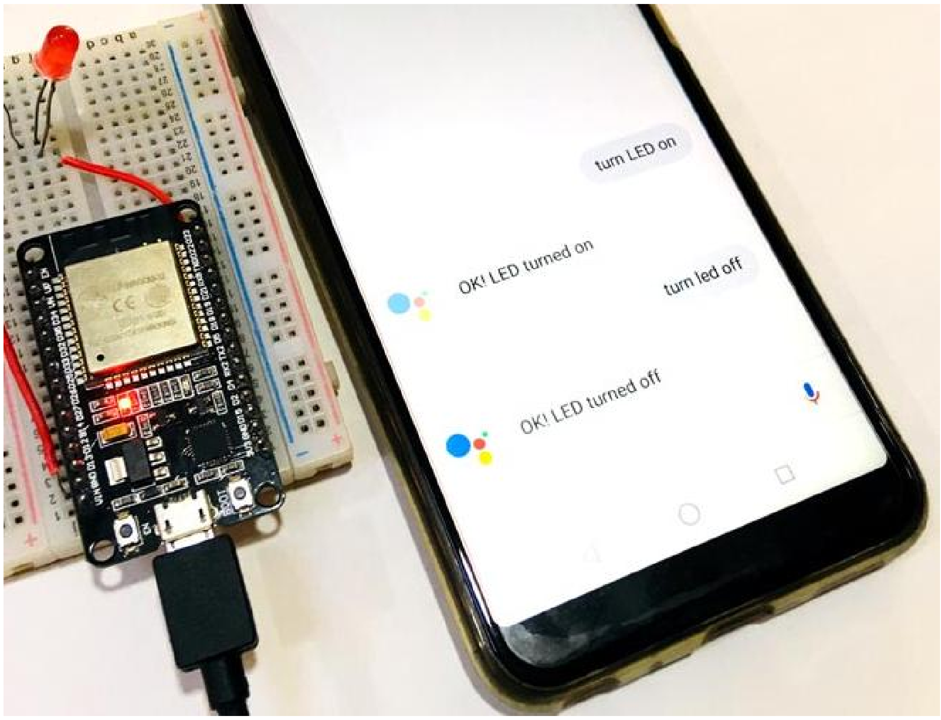
Upload the following code to the NodeMCU, replacing "YOUR_WIFI_SSID", "YOUR_WIFI_PASSWORD", and "YOUR_THINGSPEAK_API_KEY" with your actual values:



Connection with IFTTT



Connection with adafruit and relays,wifimodule



turn LED on

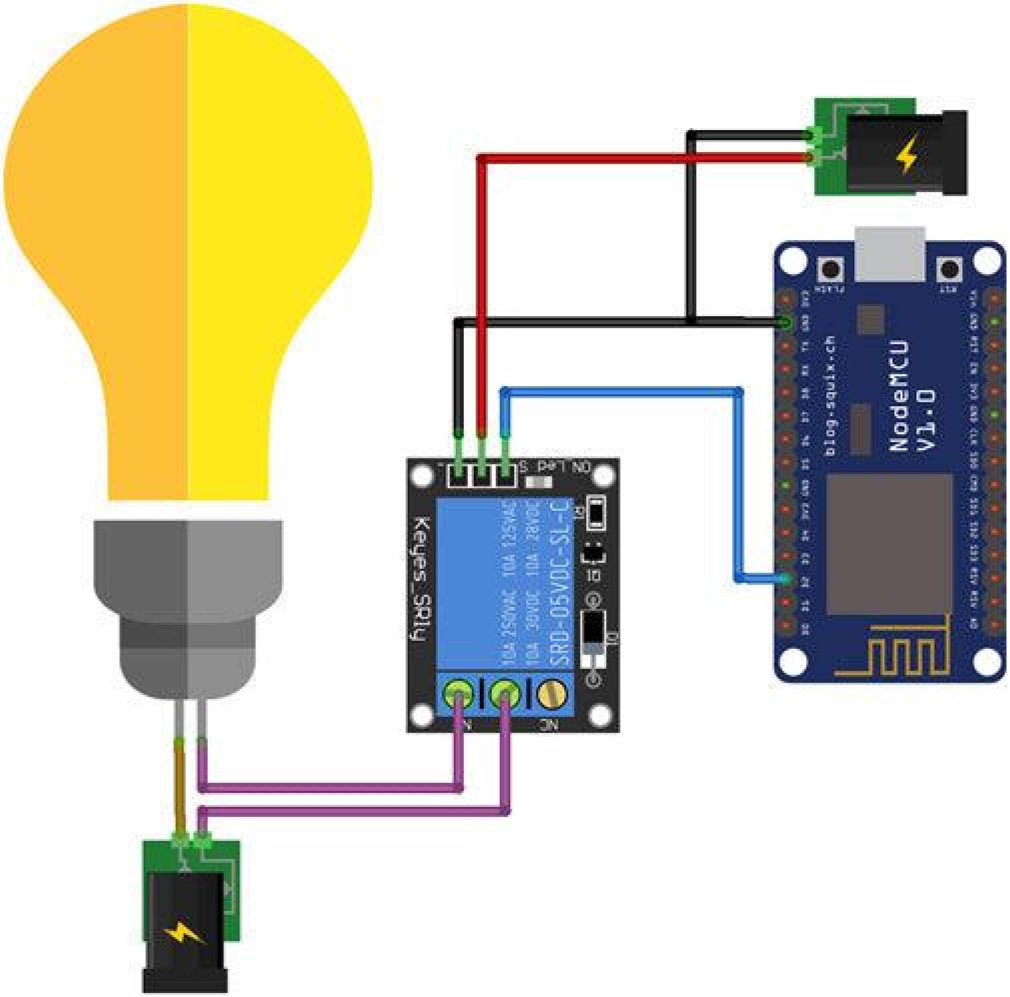
OK! LED turned on

turn led off

OK! LED turned off

Blinking Led using Google assistant

Circuite Diagram:



Circuite diagram for home automation blinking of LED

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Components:

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LED connected to NodeMCU's GPIO pin.

Steps:

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Connect the NodeMCU to your computer via USB.

Upload the following code to the NodeMCU, replacing "YOUR_WIFI_SSID", "YOUR_WIFI_PASSWORD", and "YOUR_THINGSPEAK_API_KEY" with your actual values:

Code:

```
#include <ESP8266WiFi.h>
#include <ThingSpeak.h>

const char* ssid = "YOUR_WIFI_SSID";
const char* password = "YOUR_WIFI_PASSWORD";
const unsigned long channelID = YOUR_CHANNEL_ID;
const char* api_key = "YOUR_THINGSPEAK_API_KEY";
const int ledPin = D1; // GPIO pin connected to the LED

WiFiClient client;

void setup() {
  pinMode(ledPin, OUTPUT);

  Serial.begin(115200);
  delay(10);

  WiFi.begin(ssid, password);

  while (WiFi.status() != WL_CONNECTED) {
    delay(500);
    Serial.print(".");
  }
  Serial.println("");
  Serial.println("WiFi connected");
  Serial.println("IP address: ");
  Serial.println(WiFi.localIP());

  ThingSpeak.begin(client);
}

void loop() {
  ThingSpeak.readChannel(channelID, api_key);

  if (ThingSpeak.isChannelValueUpdated(1)) {
    int ledState = ThingSpeak.getFieldAsInt(1);

    if (ledState == 1) {
      digitalWrite(ledPin, HIGH); // Turn on the LED
    } else {
      digitalWrite(ledPin, LOW); // Turn off the LED
    }
  }

  delay(1000);
}
```

Testing and Deployment:

1. Upload the firmware or code to your microcontroller or development board.

2. Power on the setup and ensure that the Wi-Fi module connects to your local network.

3. Test different scenarios and conditions to ensure the reliability and functionality of the system.

4. Once we are satisfied with the testing results, deploy the setup in the desired location, ensuring proper electrical connections and safety measures.

Conclusion:

The Home Automation Light Blinking IoT project enables remote control of a light fixture using a Wi-Fi module, relay, IFTTT. By following the hardware and software setup instructions, we can build and deploy a system that allows you to control our light. from anywhere, adding convenience and automation to your home.