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Home Automation Project

Hardware Required:

1. Bolt Wifi Module
2. Relay Module(depends on capability of controlling devices based on their Voltage for example 250V device)
3. Jumper Wires
4. Holder with electrical wire
5. LED Bulb

Cloud: Can be considered as a bank locker, where you can store all your information safely and securely. And whenever you want to access the locker, you can access it any time and only you can access it.

IoT: It is used to store sensor data, it is used to communicate with sensors, modules,chips etc. It is an upcoming technology that allows us to control hardware devices through the internet. Here we propose to use IOT in order to control home appliances, thus automating modern homes through the internet.

Understanding general Cloud Architecture

Basically there's a device which is connected to the cloud service and this cloud service is then connected to the appliance.

For example: we want to operate on/off the bulb so there are operating buttons in the device that will communicate with cloud service and keep the bulb in on and off position and get the task done.

As soon as the button is pressed, it will go to the cloud service after that cloud service will find the product or appliance and it will perform the task or make the bulb glow.

API(Application Programming Interface)

Basically, these are the communication protocols which help us communicate between two different applications, interfaces and softwares.

For example: Ola, Uber etc have a map section which tells you where your rider is, what is your current location and how far you reached from your actual destination. So how uber get to know your location through google map, so there is something going on

internally between google and uber that is using API's they are communicating with each other that is google map is sending data to uber and Uber is sending data to maps.

For example: you want to send a gift to your friend's office by delivery boy so this boy is performing the task in the form of API, and this will give a response back also that whether it is delivered or not or in the form of feedback or take some action.

Similarly , the API sends tasks and data or helps us perform a task to other softwares and gives back responses whether it is successful or not.

In this project, we will ask the API's to control our devices, go to my device and turn it on/off.

There are various forms of API's based on the task you want to achieve. For instance to on/off, to restart.

https://docs.boltiot.com/docs/introduction

Objective of the Project:
We are going to control the real life LED bulb using the Bolt wifi module.

How to approach?

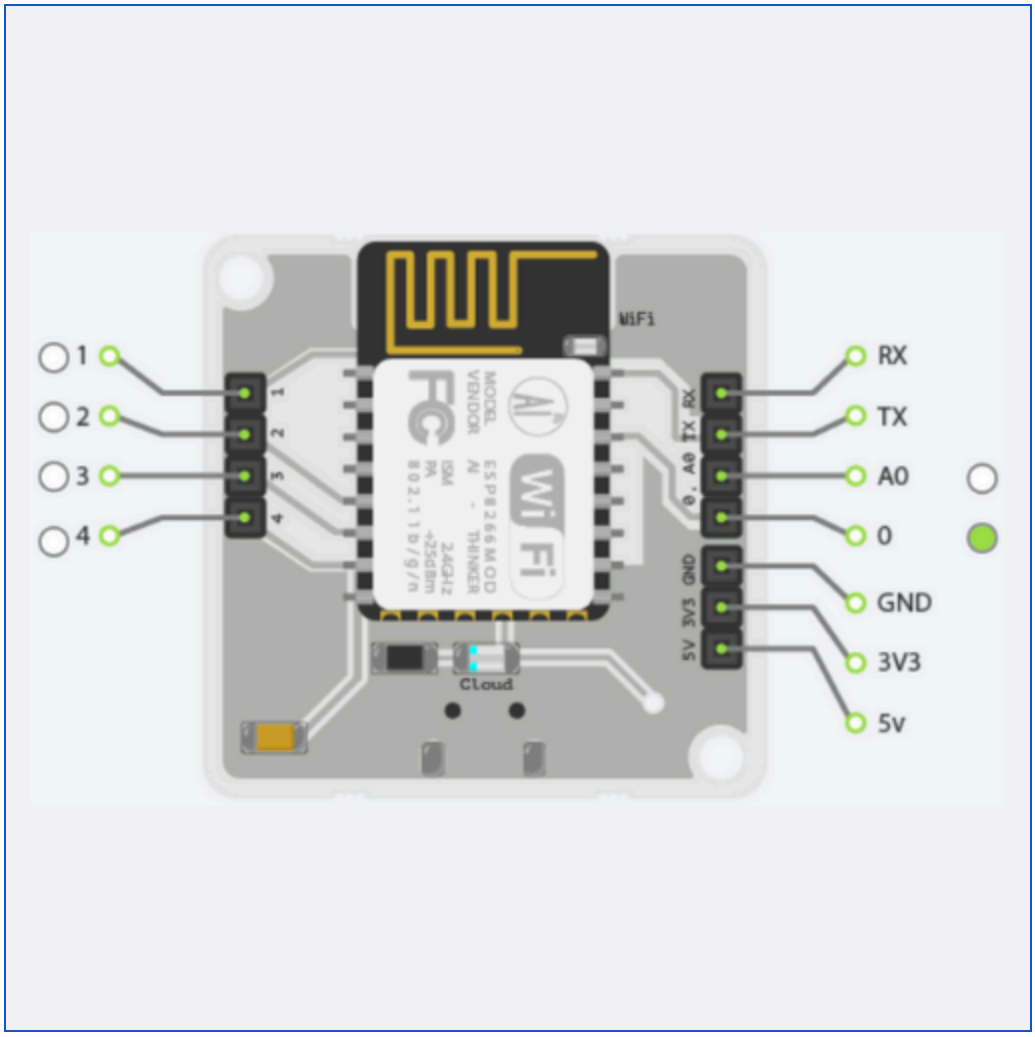
First to create an app or web interface which has two buttons one for turning it on and one for turning it off.

WEB/APP—————————>(Bolt) API's—————————————> BULB

Whenever the on button is pressed, I'll ask the Bolt API's to turn the device on
Similarly for off.

Controlling LED using Bolt cloud

Positive-longer leg of LED is connected to Pin number 0
Negative-shorter leg of the LED is connected to ground(which is pin no. 4 in bolt wifi module)



Always recommended to use a resistor when keeping the LED for a longer time.

Programming Part:

Going to write a program to control the LED.

1. create a new product that means you are creating a new project. Add the name “YellowLEDControl” to it, select the input or output device and click on done.
2. To write a code, go to configure this product icon, you’ll see three options Readme, Hardware, Code.
3. Some pre-defined code templates can be found by clicking on the code snippets icon and then selecting the code for controlling the LED.
4. Select the code and insert it directly. Give the filename “YellowLEDControl”and the extension is Js.

5. Whenever we connect any output devices that are LED's, Bulbs we connect them to digital pins, they actually work as switches only either to turn on or off.
6. In the case of LED we need only two pins either to give power supply or to cut the power supply or more technically either 0 or 5V.
7. So when we need to turn on something we keep the value HIGH, and when we need to turn off on something we keep the value LOW.
8. Now save the code
9. Connect the USB cable to the wifi module and then to lappy, after it is connected to interest it will give green light.
10. Go to the device and check whether your device is showing online or not.
11. Now to push the code to the device we have to link it to the device, so as to perform the task accordingly.
12. Now go to the link icon and then it will ask which device you want to link, select and do it.
13. Now the device is connected to yellow LED control and now go to view device option
14. Now you will see two buttons on the web or mobile app, on it or off it.

since , LED do not require much power, now we will talk about appliances that work on 220-250V

How to control real world appliances that work on 220-250V?

1. So the relay module is basically a switch which helps to control the real world appliances.
2. Usually the bolt wifi module works on 5V, using the 5V the relay module can work on appliances, which is the beauty of the relay module.
3. In case of HIGH and LOW value, it's opposite to the bolt wifi module.
   When the digital pin is LOW it will ON.
   When the digital pin is HIGH it will OFF.

4. Connect 3 jumper wires with ground,VCC and signal.
5. Now connect the VCC of relay with 5V of bolt wifi module
6. Now connect the ground of the relay to the ground of the relay module.
7. The last signal pin of the relay is connected to pin no. 1 of the bolt wifi module.
8. Now cut any-one wire from the electric wire which is with holder and insert and tighten it to relay module's back side i.e. NO,C or NC. and connect the bulb with the holder.
9. Now follow the same procedure of adding a new product to the list.
10. This time instead of taking code from snippets, take the code from https://docs.boltiot.com/docs/controlling-output-devices-glowing-an-led for various button designs.
11. Copy the code:

```
var dual =dualButton("left");
dual.first_button({name:"Led Off", action:"digitalWrite",
                   pin:"0", value:"LOW", bgcolor:"blue",
                   shape:"rectangle", text_color:"white"})

dual.second_button({name:"Led on", action:"digitalWrite",
                    pin:"0", value:"HIGH", bgcolor:"black",
                    shape:"rectangle", text_color:"white"})
```

12. Paste it to a bolt cloud.
13. Change the buttons alignment from left to center.
14. For LOW it will be bulb on.
15. For HIGH it will be bulb off.
16. And since it is connected to the pin no. 1 of the bolt wifi module, so code will be changed from pin no. 0 to pin no. 1 .

Edited code:

```
var dual =dualButton("Centre");
dual.first_button({name:"Bulb On", action:"digitalWrite",
                   pin:"1", value:"LOW", bgcolor:"blue",
                   shape:"rectangle", text_color:"white"})

dual.second_button({name:"Bulb off", action:"digitalWrite",
                    pin:"1", value:"HIGH", bgcolor:"black",
                    shape:"rectangle", text_color:"white"})
```

17. Now when someone presses the button bulb on it will change the value of pin 1 to LOW and vice versa.
18. Save the code and then the same steps to be followed.
19. You'll see the interface design which you choose with on and off buttons.

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