

Assignment - 2

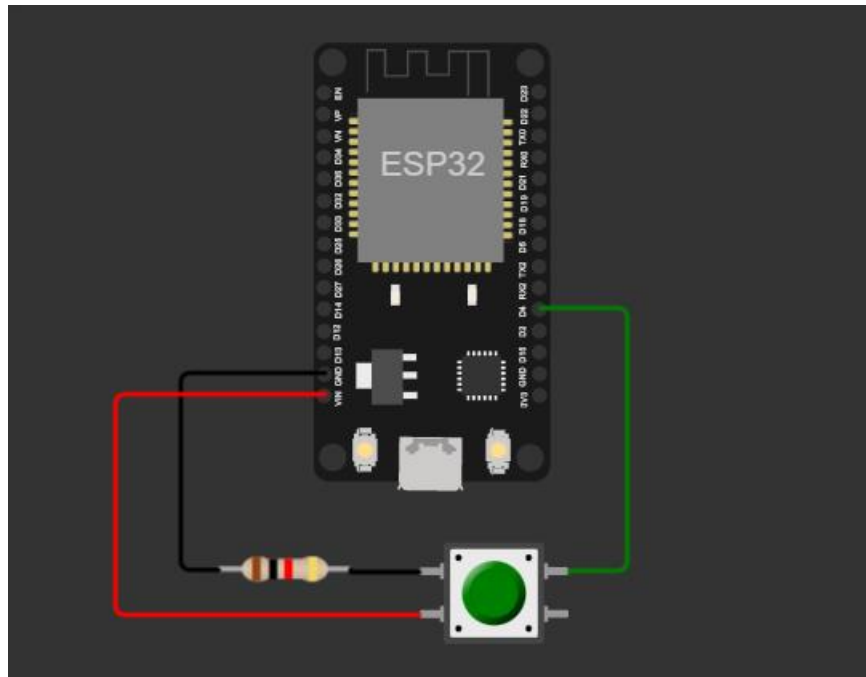
Apoorv Gupta
20BCT0117

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Uploading data on IBM Cloud

Q- Using ESP32, make a circuit in Wokwi using a push button to send 0s and 1s to IBM Cloud.

Circuit:



For testing we will use builtin LED : pin no. – 2(GPIO2) to check if the push button is working or not.

Code:

```
#include <WiFi.h>
#include <PubSubClient.h>
#define OUT 4

void callback(char* subscribetopic, byte* payload, unsigned int payloadLength);

#define ORG "#####" // it should remain confidential
#define DEVICE_TYPE "VirtualIoT"
#define DEVICE_ID "5901"
#define TOKEN "#####" // it should remain confidential
String data3;

char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/evt/Data/fmt/json";
char subscribetopic[] = "iot-2/cmd/command/fmt/String";
char authMethod[] = "use-token-auth";
char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;

WiFiClient wifiClient;
PubSubClient client(server, 1883, callback, wifiClient);

void setup(){
  Serial.begin(115200);
  pinMode(OUT, INPUT);
  pinMode(LED_BUILTIN, OUTPUT);
  delay(10);
  Serial.println();
  wificonnect();
  mqttconnect();
}

void loop(){
  int state = digitalRead(OUT);
  digitalWrite(LED_BUILTIN, state);
  PublishData(state);
  delay(1000);
  if (!client.loop()) {
    mqttconnect();
  }
}

void PublishData(int value) {
  mqttconnect();
  String payload = String(value);

  Serial.print("Sending payload: ");
```

```

Serial.println(payload);

if (client.publish(publishTopic, (char*) payload.c_str())) {
    Serial.println("Publish ok");
} else {
    Serial.println("Publish faiOUT");
}
}

void mqttconnect() {
    if (!client.connected()) {
        Serial.print("Reconnecting client to ");
        Serial.println(server);
        while (!client.connect(clientId, authMethod, token)) {
            Serial.print(".");
            delay(500);
        }

        initManagedDevice();
        Serial.println();
    }
}

void wificonnect(){
    Serial.println();
    Serial.print("Connecting to ");

    WiFi.begin("Wokwi-GUEST", "", 6);
    while (WiFi.status() != WL_CONNECTED) {
        delay(500);
        Serial.print(".");
    }
    Serial.println("");
    Serial.println("WiFi connected");
    Serial.println("IP address: ");
    Serial.println(WiFi.localIP());
}

void initManagedDevice() {
    if (client.subscribe(subscribetopic)) {
        Serial.println((subscribetopic));
        Serial.println("subscribe to cmd OK");
    } else {
        Serial.println("subscribe to cmd FAIOUT");
    }
}

void callback(char* subscribetopic, byte* payload, unsigned int payloadLength){
    Serial.print("callback invoked for topic: ");
    Serial.println(subscribetopic);
    for (int i = 0; i < payloadLength; i++) {

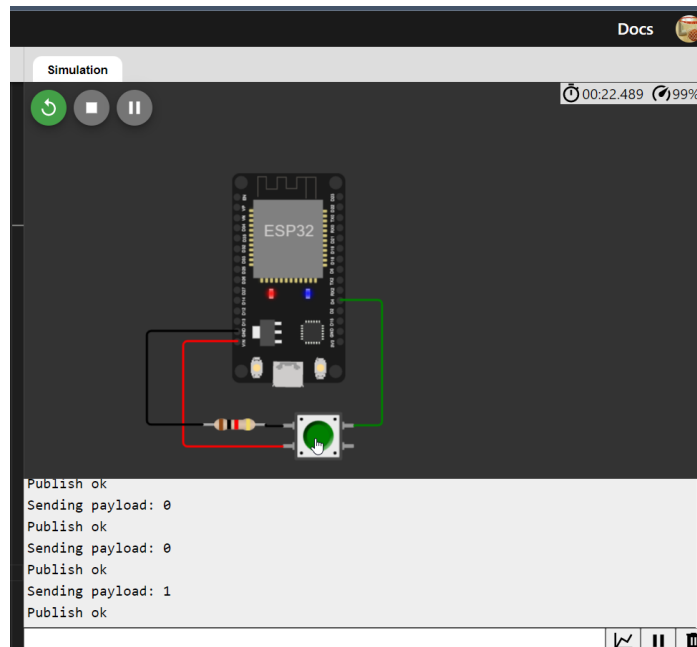
```

```

    data3 += (char)payload[i];
}
Serial.println("data: " + data3);
}

```

OUTPUTS:



LED Glows(Blue)

Serial Monitor:

```

Connecting to ....
WiFi connected
IP address:
10.10.0.2
Reconnecting client to uhf62a.messaging.internetofthings.ibmcloud.com
iot-2/cmd/command/fmt/String
subscribe to cmd OK

Sending payload: 0
Publish ok
Sending payload: 0
Publish ok
Sending payload: 1
Publish ok
Sending payload: 1
Publish ok
Sending payload: 1
Publish ok
Sending payload: 0
Publish ok
Sending payload: 1
Publish ok

```


IBM Cloud output:

The screenshot displays the IBM Watson IoT Platform interface. At the top, the header shows 'IBM Watson IoT Platform' and a user profile for 'apoorv.gupta2020@vitstudent.ac.in' with ID 'uhf62a'. The main navigation bar includes 'Browse', 'Action', 'Device Types', and 'Interfaces'. A search bar is present with the text 'Search by Device ID'. A 'Device Simulator' toggle is visible. The central table lists devices, with one device (ID 5901) highlighted. Below the table, the 'Recent Events' tab is selected, showing a stream of data events.

Device ID	Status	Device Type	Class ID	Date Added	Descriptive Location
5901	Connected	VirtualIoT	Device	24 May 2023 19:48	

Event	Value	Format	Last Received
Data	1	json	a few seconds ago
Data	0	json	a few seconds ago
Data	1	json	a few seconds ago
Data	1	json	a few seconds ago
Data	1	json	a few seconds ago

Wokwi Project Link:

[Assignment2Push - Wokwi ESP32, STM32, Arduino Simulator](#)