IBM ASSIGNMENT - 4

Date	02 November 2022
Team ID	PNT2022TMID53764
Name	Child Safety Monitoring and Notification

QUESTION :

Write code and connections in wokwi for ultrasonic sensor. Whenever distance is less than 100 cms send “alert” to IBM cloud and display in device recent events.

CODE :

```
#include <WiFi.h>                // library for wifi

#include <PubSubClient.h>                    // library for MQTT
 //------- credentials of IBM Accounts ---------
#define ORG "rwazv5"             // IBM organisation id
  #define DEVICE_TYPE "NodeRed" // Device type mentioned in ibm watson iot platform
  #define DEVICE_ID "12345"  // Device ID mentioned in ibm
watson iot platform #define TOKEN "vC@S3TBre6(97jAOJ_"            // Token
#define          speed
  0.034 #define led 14
  String data3;
  int LED = 4;
// ..... customise above values ..... -

   char server[] = ORG ".messaging.internetofthings.ibmcloud.com"; // server name char
   publishTopic[] = "iot-2/evt/sreedhar/fmt/json";          // topic name and type of event perform
  and format in which data to be send
char topic[] = "iot-2/cmd/led/fmt/String";             // cmd Represent type and command is test
  format of strings
char authMethod[] = "use-token-auth";          // authentication method
   char token[] = TOKEN;
   char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID; //Client id

// ------------------------------------------------------------------------------------------------------

WiFiClient wifiClient;             // creating instance for wificlient
  PubSubClient client(server, 1883, wifiClient); // calling the predefined client id by passing parameter like server id,port and
  wifi credential


  const int trigpin=5;
  const int echopin=18; String
```

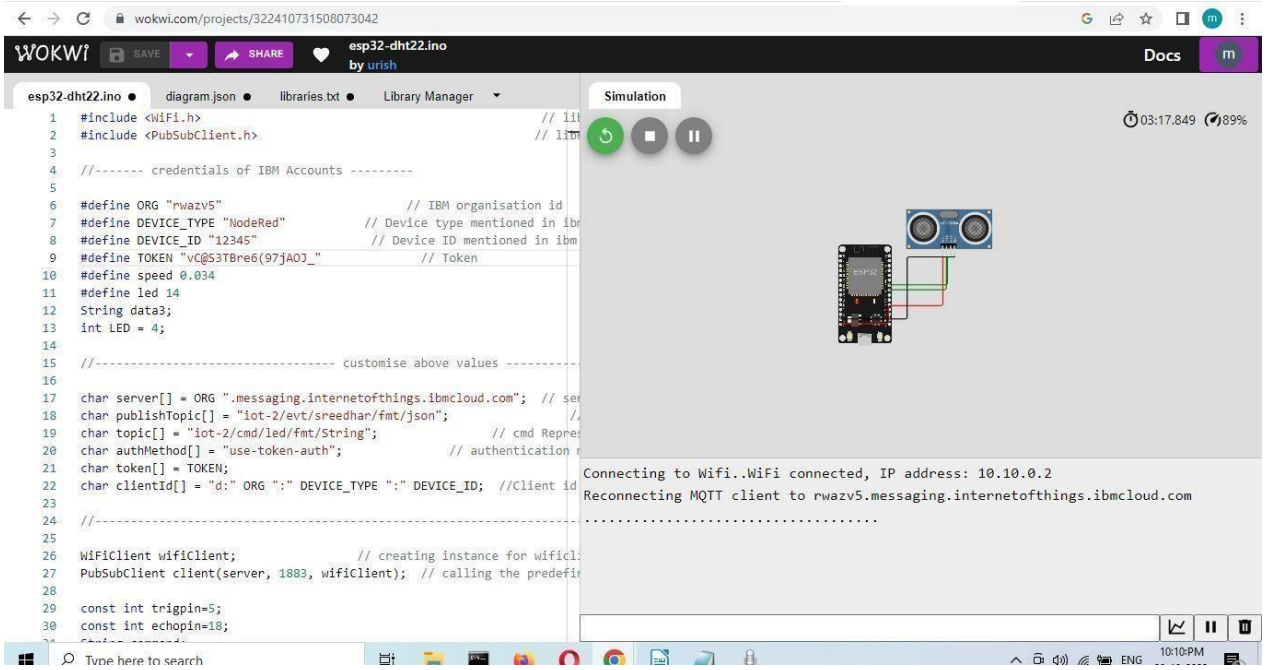
```
command;
String data="";


long duration;
float dist;


void setup()
{
Serial.begin(115200); pinMode(led,
OUTPUT); pinMode(trigpin,
OUTPUT); pinMode(echopin,
INPUT); wifiConnect();
mqttConnect();
}


void loop() { bool isNearby
=       dist       <
        100;
digitalWrite(led,
isNearby);


publishData(
); delay(500);


if (!client.loop())
{
 mqttConnect();                    // function call to connect to ibm
}
}

/*_____retrieving to cloud_____*/


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

```
 void mqttConnect()
 {
 if (!client.connected())
 {
 Serial.print("Reconnecting MQTT client to ");
 Serial.println(server); while
 (!client.connect(clientId, authMethod, token))
 {
 Serial.print("."
 ); delay(500);
 }
 initManagedDevice();
 Serial.println();
 } }
void
 initManagedDevice() { if
 (client.subscribe(topic))
 {
 Serial.println("IBM subscribe to cmd OK");
 }
 else
 {
 Serial.println("subscribe to cmd FAILED");
 }
 }
 void publishData()
 {
 digitalWrite(trigpin,LOW
 );
 digitalWrite(trigpin,HIGH
 );
 delayMicroseconds(10); digitalWrite(trigpin,LOW);
 duration=pulseIn(echopin,HIGH);
 dist=duration*speed/2;
 if(dist<100)
 {
 digitalWrite(LED,HIGH);
 String payload = "{\"Alert
Distance\":"; payload += dist; payload
 += "}"; Serial.print("\n");
 Serial.print("Sending payload: "); Serial.println(payload); if (client.publish(publishTopic, (char*)
payload.c_str())) // if data is uploaded to cloud successfully,prints publish ok else prints publish
failed
 {
 Serial.println("Publish OK");
 }

 }
```

```
if(dist>100)
{
digitalWrite(LED,HIGH);
String payload =
"{\"Distance\":"; payload +=
dist;
payload += "}";

Serial.print("\n");
Serial.print("Sending payload:
"); Serial.println(payload);
if(client.publish(publishTopic, (char*) payload.c_str()))
{
Serial.println("Publish OK");
}
else
{
digitalWrite(LED,LOW); Serial.println("Publish
FAILED");
}

}

}
```

OUTPUT :

Code simulation on wokwi



Data sent to IBM Cloud with distance