IBM ASSIGNMENT - 4

Date	09 November 2022
Team ID	PNT2022TMID01167

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.

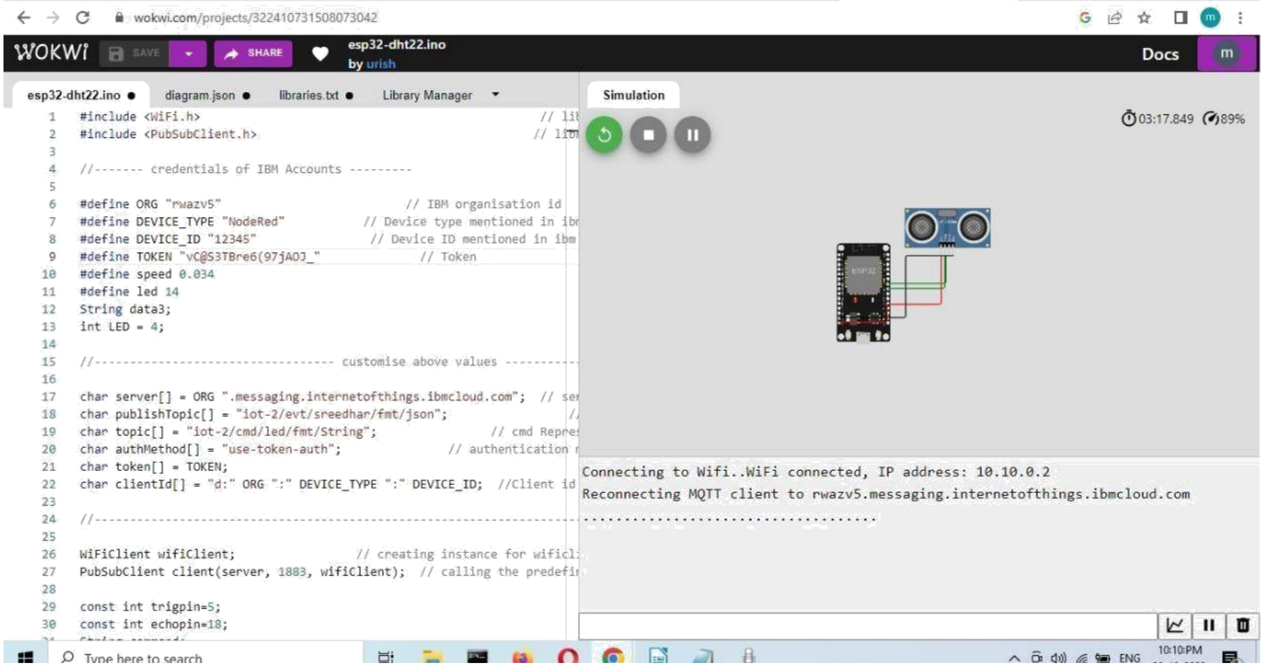
CODE :

```
#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");
 }

 }


}
```

<u>OUTPUT</u> :

Code simulation on wokwi



```
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```
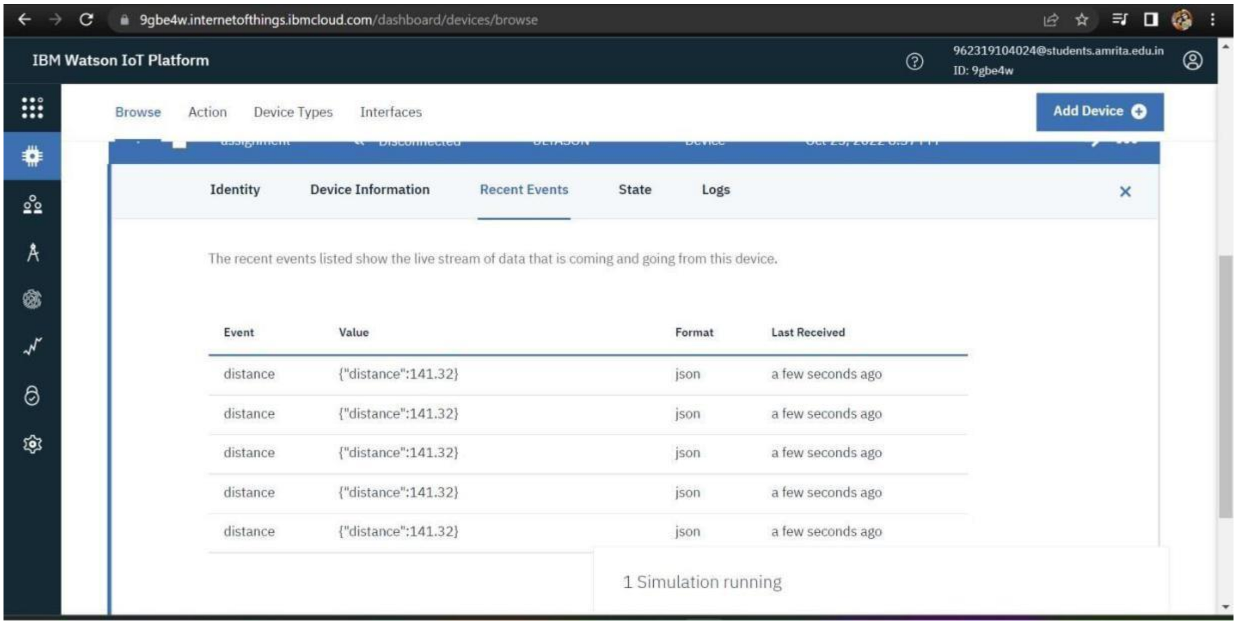

```
Connecting to Wifi..WiFi connected, IP address: 10.10.0.2
Reconnecting MQTT client to rwazv5.messaging.internetofthings.ibmcloud.com
..................................
```

Data sent to IBM Cloud with distance



The recent events listed show the live stream of data that is coming and going from this device.

Event	Value	Format	Last Received
distance	{"distance":141.32}	json	a few seconds ago
distance	{"distance":141.32}	json	a few seconds ago
distance	{"distance":141.32}	json	a few seconds ago
distance	{"distance":141.32}	json	a few seconds ago
distance	{"distance":141.32}	json	a few seconds ago