IBM ASSIGNMENT-4

-DEEPIKA J (2019504017)

sketch.ino

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

#include <PubSubClient.h>//library for MQtt

#define ECHO_PIN 2

#define TRIG_PIN 4

#define LED 5



//-------credentials of IBM Accounts------

#define ORG "ryvatp"//IBM ORGANITION ID

#define DEVICE_TYPE "ad"//Device type mentioned in ibm watson IOT Platform

#define DEVICE_ID "arda"//Device ID mentioned in ibm watson IOT Platform

#define TOKEN "9003439601"   //Token



//-------- Customise the above values --------

char server[] = ORG ".messaging.internetofthings.ibmcloud.com";// Server Name

char publishTopic[] = "iot-2/evt/Data/fmt/json";// topic name and type of event
perform and format in which data to be send

char subscribetopic[] = "iot-2/cmd/test/fmt/String";// cmd  REPRESENT command
type AND COMMAND IS TEST OF FORMAT STRING

char authMethod[] = "use-token-auth";// authentication method

char token[] = TOKEN;

char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;//client id
```

```
//.....
WiFiClient wifiClient; // creating the instance for wificlient
PubSubClient client(server, 1883,wifiClient); //calling the predefined client id by passing parameter like server id,portand wificredential
void setup()// configureing the ESP32
{
  Serial.begin(115200);
  pinMode(TRIG_PIN, OUTPUT);
  pinMode(ECHO_PIN, INPUT);
  pinMode(LED,OUTPUT);
  delay(10);
  Serial.println();
  wificonnect();
  mqttconnect();
}


float readDistanceCM() {
  digitalWrite(TRIG_PIN, LOW);
  delayMicroseconds(2);
  digitalWrite(TRIG_PIN, HIGH);
  delayMicroseconds(10);
  digitalWrite(TRIG_PIN, LOW);
  int duration = pulseIn(ECHO_PIN, HIGH);
  return duration * 0.034 / 2;
}
```

```
void loop()// Recursive Function
{
  float distance = readDistanceCM();
  bool isNearby = distance < 100;
  digitalWrite(LED, isNearby);
  Serial.print("Measured distance: ");
  Serial.println(distance);
  delay(100);
  if (isNearby == 1){
  PublishData(distance);
  }
  delay(1000);
  if (!client.loop()) {
    mqttconnect();
  }
}
/*.....................................retrieving to
Cloud. ............................ */
void PublishData(float distance) {
  mqttconnect();//function call for connecting to ibm
  /*
     creating the String in in form JSon to update the data to ibm cloud
  */
  String payload = "{\"Alert\":""\"";
  payload += distance;
  payload += " is less than 100cms\"";
  payload += "}";
```

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

if (client.publish(publishTopic, (char*) payload.c_str())) {
    Serial.println("Publish ok");// if it sucessfully upload data on the cloud
then it will print publish ok in Serial monitor or else it will print publish
failed
  } else {
    Serial.println("Publish failed");
  }

}
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() //function defination for wificonnect
{
  Serial.println();
  Serial.print("Connecting to ");


  WiFi.begin("Wokwi-GUEST", "", 6);//passing the wifi credentials to establish
the connection
  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 FAILED");
  }
}
```

diagram.json

```
{
  "version": 1,
  "author": "Deepika J","editor":
  "wokwi",
  "parts": [
    { "type": "wokwi-esp32-devkit-v1", "id": "esp", "top": -17.57, "left": -
116.71, "attrs": {} },
    {
      "type": "wokwi-led",
      "id": "led1",
      "top": -16.04,
      "left": 21.83,
      "attrs": { "color": "red" }
    },
    {
      "type": "wokwi-resistor",
      "id": "r1",
      "top": 41.63,
      "left": 48.17,
      "attrs": { "value": "1000" }
    },
    { "type": "wokwi-hc-sr04", "id": "ultrasonic1", "top": -69.2, "left": 151.85,
"attrs": {} }
  ],
```

```
  "connections": [
    [ "esp:TX0", "$serialMonitor:RX", "", [] ],
    [ "esp:RX0", "$serialMonitor:TX", "", [] ],
    [ "led1:A", "r1:1", "green", [ "v0" ] ],
    [ "r1:2", "esp:D5", "green", [ "v0" ] ],
    [ "led1:C", "esp:GND.1", "black", [ "v0" ] ],
    [ "esp:D4", "ultrasonic1:TRIG", "green", [ "h246.49", "v-79.83" ] ],
    [ "esp:D2", "ultrasonic1:ECHO", "green", [ "h0" ] ],
    [ "esp:GND.1", "ultrasonic1:GND", "black", [ "h262.72", "v-104.77" ] ],
    [ "ultrasonic1:VCC", "esp:3V3", "red", [ "v0" ] ]
  ]
}
```

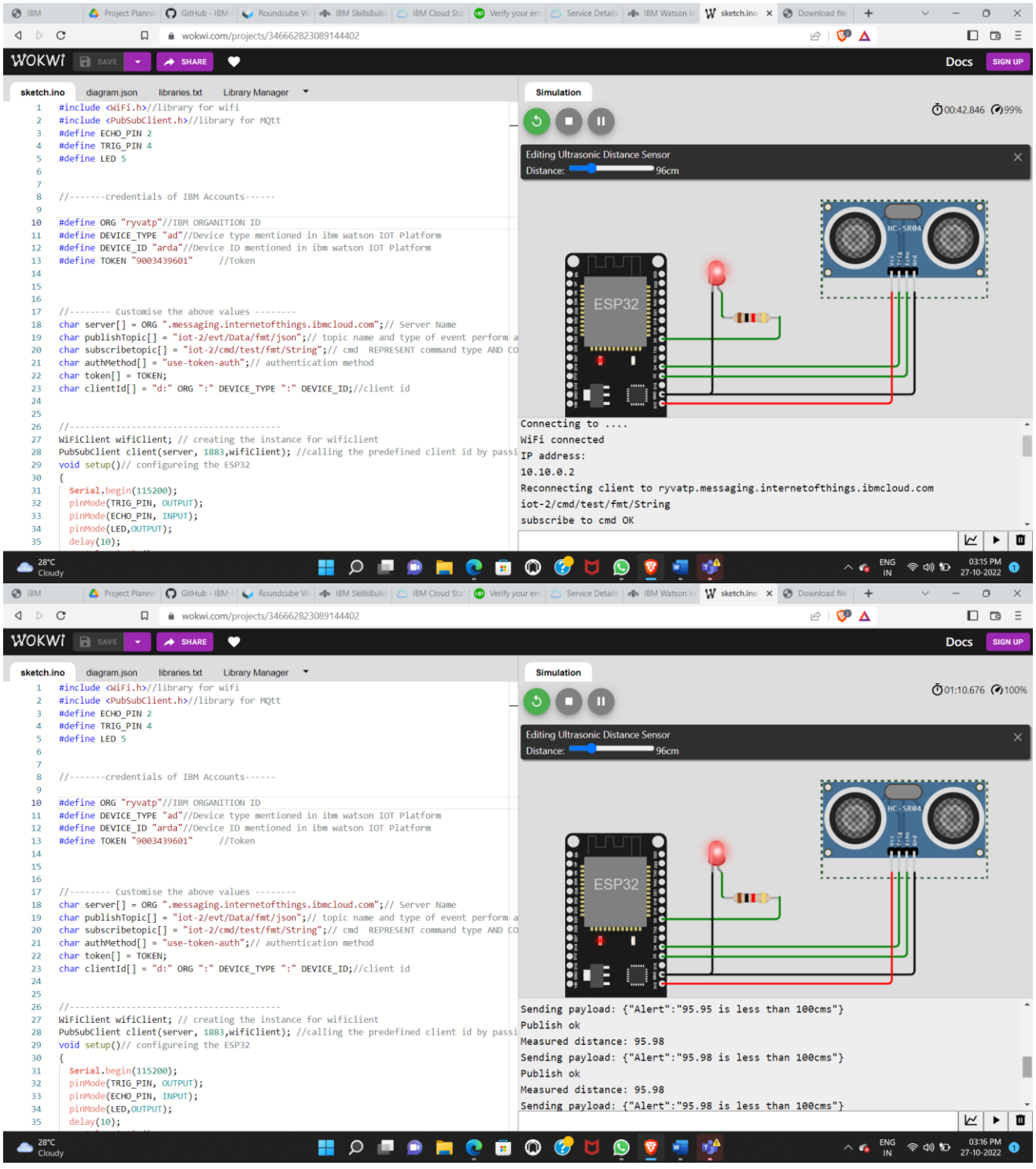
libraries.txt

```
# Wokwi Library List
# See https://docs.wokwi.com/guides/libraries

# Automatically added based on includes:

PubSubClient
ArduinoJson
```

PICTURE:


wokwi.com/projects/346662823089144402
WOKWI
SAVE
SHARE
Docs
SIGN UP
sketch.ino
diagram.json
libraries.txt
Library Manager
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pinMode(TRIG_PIN, OUTPUT);
pinMode(ECHO_PIN, INPUT);
pinMode(LED,OUTPUT);
delay(10);
Simulation
00:42.846
99%
Editing Ultrasonic Distance Sensor
Distance:
96cm
ESP32
HC-SR04
Connecting to ....
WiFi connected
IP address:
10.10.0.2
Reconnecting client to ryvatp.messaging.internetofthings.ibmcloud.com
iot-2/cmd/test/fmt/String
subscribe to cmd OK
28°C
Cloudy
ENG
IN
03:15 PM
27-10-2022
01:10.676
100%
Sending payload: {"Alert":"95.95 is less than 100cms"}
Publish ok
Measured distance: 95.98
Sending payload: {"Alert":"95.98 is less than 100cms"}
Publish ok
Measured distance: 95.98
Sending payload: {"Alert":"95.98 is less than 100cms"}
03:16 PM
27-10-2022

LINK:

https://wokwi.com/projects/346662823089144402

CLOUD OUTPUT: