

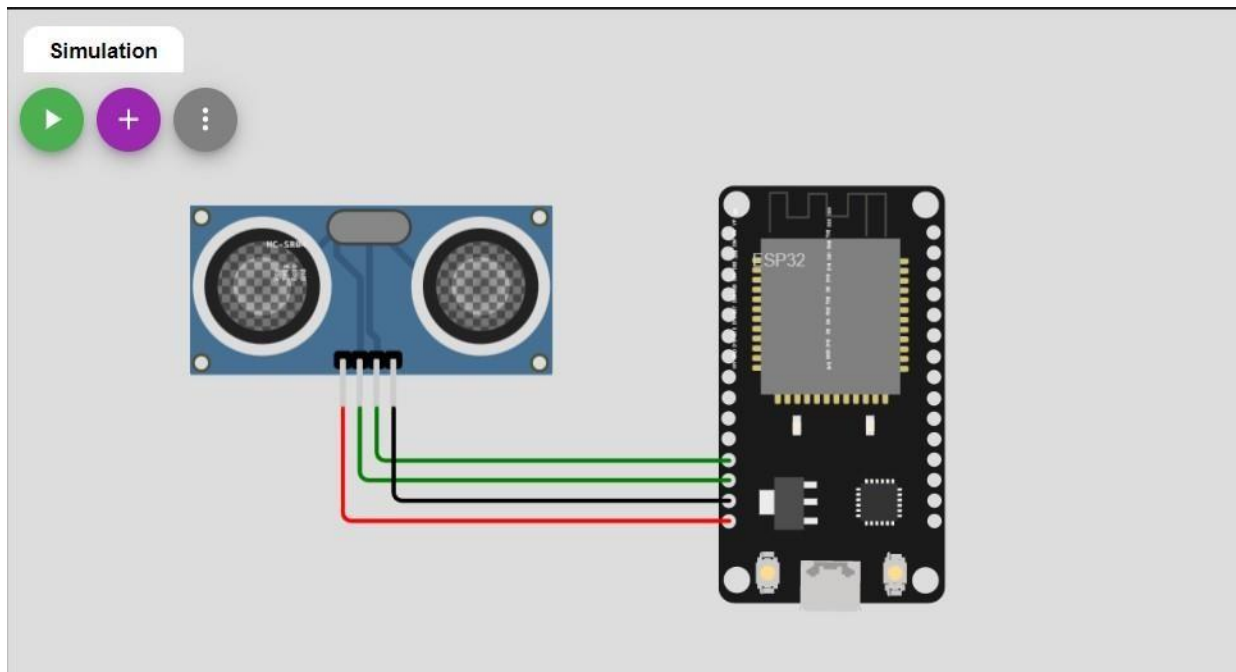
ASSIGNMENT - 4

Date	20 October 2022
Team ID	PNT2022TMID04725
Project Name	Project – Industry specific intelligent fire management system
Maximum Marks	2 Marks

Objective:

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

Circuit Diagram:



```
Publish ok
Sending payload: {"MESSAGE":"ALERT"}
Publish ok
Sending payload: {"MESSAGE":"ALERT"}
Publish ok
Sending payload: {"MESSAGE":"ALERT"}
Publish ok
```

OUTPUT:

Identity	Device Information	Recent Events	State	Logs
The recent events listed show the live stream of data that is coming and going from this device.				
Event	Value	Format	Last Received	
Data	{"MESSAGE":"ALERT"}	json	a few seconds ago	
Data	{"MESSAGE":"ALERT"}	json	a few seconds ago	
Data	{"MESSAGE":"ALERT"}	json	a few seconds ago	
Data	{"MESSAGE":"ALERT"}	json	a few seconds ago	
Data	{"MESSAGE":"ALERT"}	json	a few seconds ago	

Code:

```
#include <WiFi.h> //library for wifi
#include <PubSubClient.h> //library for MQTT
#define TRIG_PIN 13
#define ECHO_PIN 12

void callback(char* subscribetopic, byte* payload, unsigned int payloadLength);
//-----credentials of IBM Accounts-----

#define ORG "obbnyv" //IBM ORGANITION ID
#define DEVICE_TYPE "raspberrypi" //Device type mentioned in ibm watson IOT Platform
#define DEVICE_ID "123456789" //Device ID mentioned in ibm watson IOT Platform
#define TOKEN "12345678910" //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/command/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, callback ,wifiClient); //calling the predefined client id
by passing parameter like server id,portand wificredential
```

```

void setup()// configuring the ESP32
{
    Serial.begin(115200);
    pinMode(TRIG_PIN, OUTPUT);
    digitalWrite(TRIG_PIN, LOW);
    pinMode(ECHO_PIN, INPUT);
    delay(10);    Serial.println();
    wificonnect();
    mqttconnect();
} void loop()// Recursive
Function
{    digitalWrite(TRIG_PIN, HIGH);
    delayMicroseconds(10);
    digitalWrite(TRIG_PIN, LOW);    float
    duration_us = pulseIn(ECHO_PIN, HIGH);    float
    distance = 0.017 * duration_us;

    if(distance<100)
    {
        PublishData(distance,"ALERT");
    }else{
        PublishData(distance,"SAFE");
    }    delay(1000);
    if (!client.loop()) {
        mqttconnect();
    }
}

/*.....retrieving to Cloud ..... */
void PublishData(float d,char s[]) {
    mqttconnect();//function call for connecting to ibm
    /*    creating the String in in form JSon to update the data to ibm
    cloud
    */
    String payload = "{\"Distance\":\"";
    payload+=d;    payload+=",";
    payload+="\"MESSAGE\":\"";
    payload+="\"";    payload+=s;
    payload+="\"";    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");
    }
} void callback(char* subscribetopic, byte* payload, unsigned int
payloadLength)
{

}

```