ASSIGNMENT - 4

TEAM ID	PNT2022TMID27134
PROJECT NAME	SMART WASTE MANAGEMENT FOR METROPOLITANT CITIES
SUBMITTED BY	DHILEEPAN A
MARKS	2 Marks

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 :

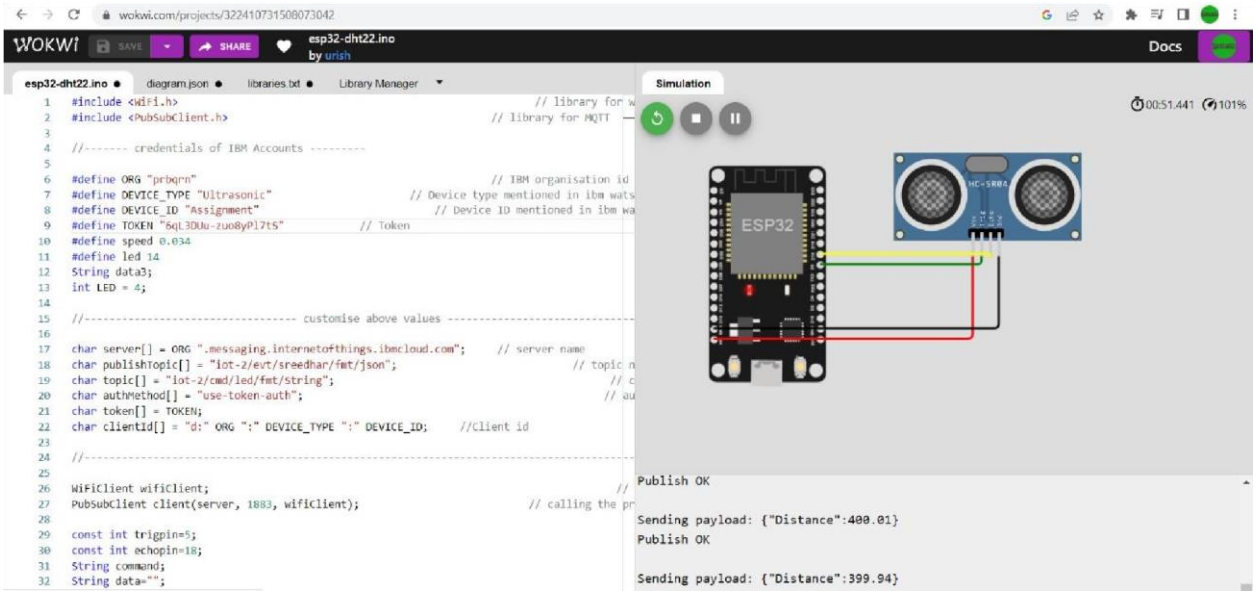
```
#include <WiFi.h>                                   // library for wifi
#include <PubSubClient.h>                           // library for MQTT

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


#define ORG "prbqrn"                                // IBM organisation id
#define DEVICE_TYPE "Ultrasonic"                    // Device type mentioned in ibm watson iot platform
#define DEVICE_ID "Assignment"                      // Device ID mentioned in ibm watson iot platform

#define TOKEN "6qL3DUu-zuo8yPl7tS"          // 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);
```

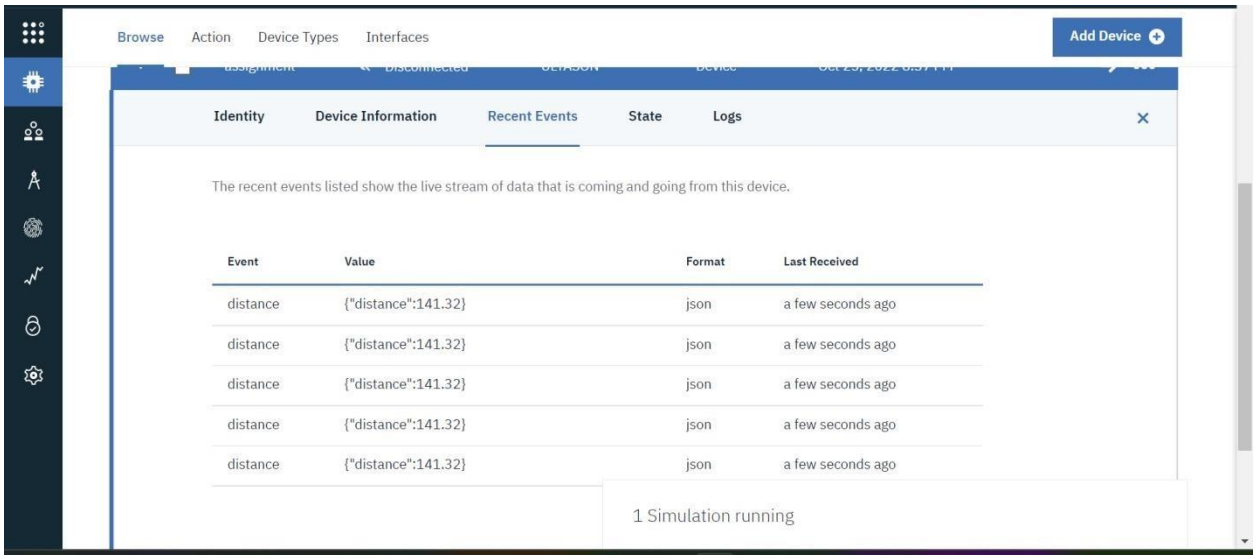
```
duration=pulseIn(echopin,HIGH);
dist=duration*speed/2;
if(dist<100)
 {
   digitalWrite(LED,HIGH);
   String payload = "{\"Alert
Distance\":";     payload         +=
dist;    payload += "}";

   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



Link : https://wokwi.com/projects/346676889639715411