ASSIGNMENT - 4

TEAM ID	PNT2022TMID27134
PROJECT NAME	SMART WASTE MANAGEMENT FOR METROPOLITANT CITIES
SUBMITTED BY	BENTYSON J
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 :

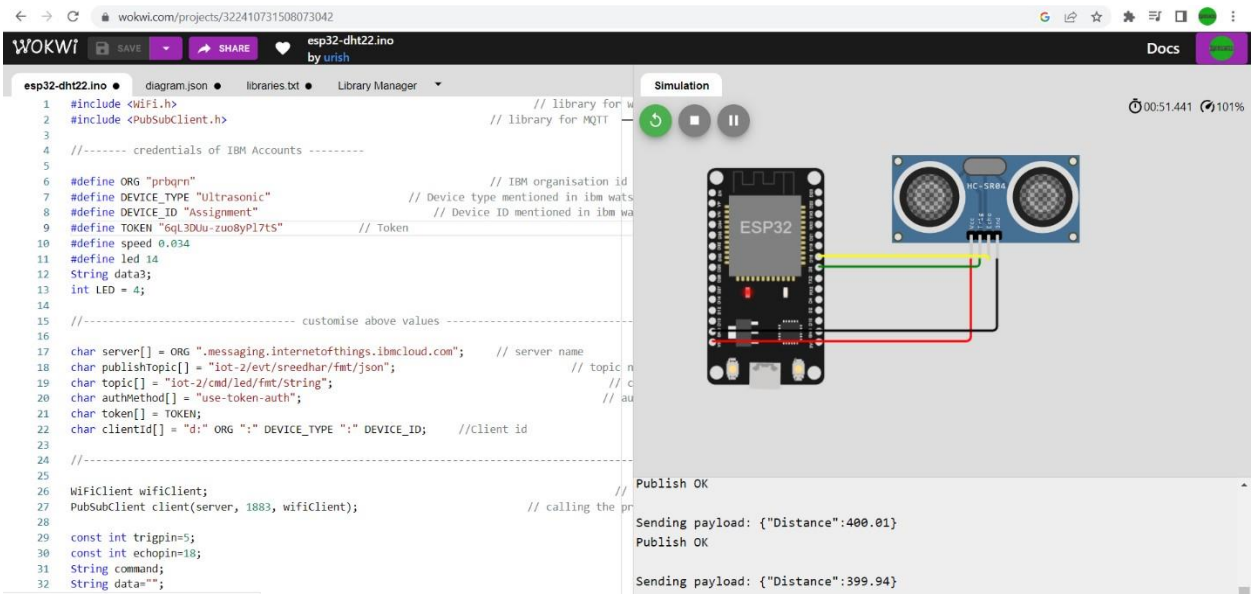
```
#include <WiFi.h>                                   // library for wifi
#include <PubSubClient.h>                           // library for MQTT

//------- 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);
```

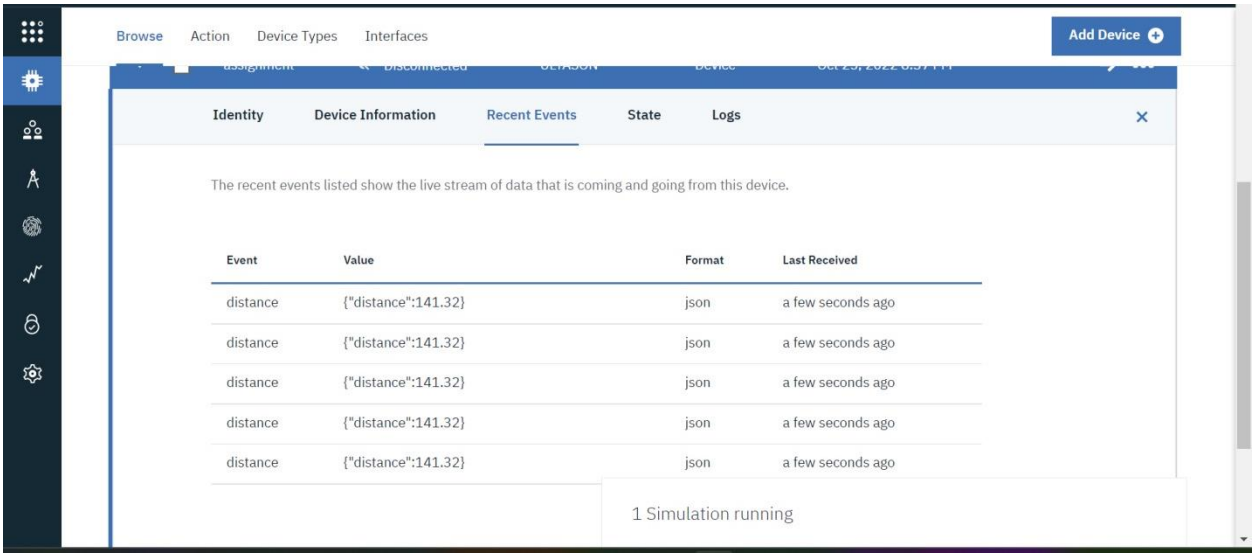
```
duration=pulseIn(echopin,HIGH);
dist=duration*speed/2;
if(dist<100)
 {
   digitalWrite(LED,HIGH);
   String payload = "{\"Alert Distance\":";
   payload       +=       dist;
payload += "}";

   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