PROBLEM STATEMENT:

IOT BASED-REAL TIME RIVER WATER

OUALITY MONITORING AND CONTROL SYSTEM

DOMAIN:

INTERNET OF THINGS

ASSIGNMENT 4:

DISTANCE DETECTION USING ULTRASOINC SENSOR

BY

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Question-1:

Write code and connections in wokwi for ultrasonic sensor. Whenever distance is less than 100cm send “alert” to IBM cloud and display in device recent events.

WOWKI LINK:

https://wokwi.com/projects/347013247322292820

Solution:

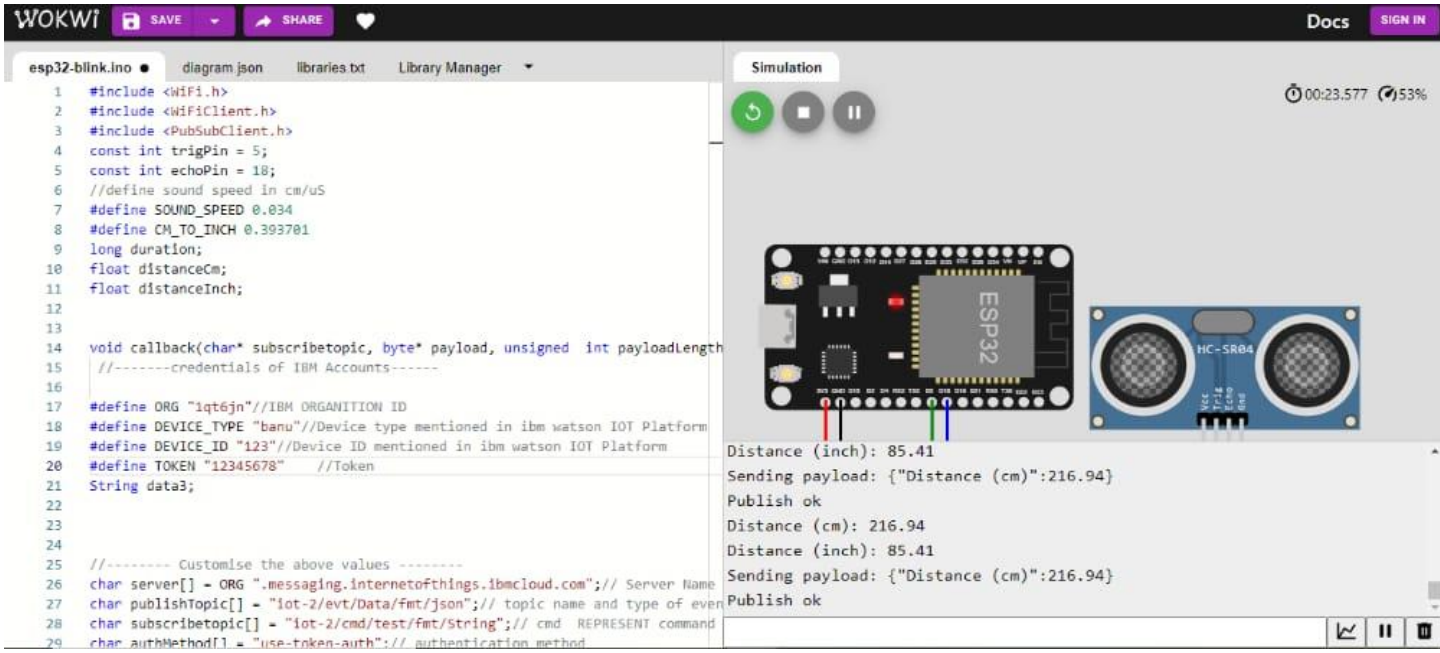
```
#include <WiFi.h>

#include <PubSubClient.h>

WiFiClientwifiClient;

String data3;

#define ORG “1qt6jn”

#define DEVICE_TYPE “Assignment-4”

#define DEVICE_ID “banu”

#define TOKEN “12345678”

#define speed 0.034

#define led 14

Char server[] = ORG “.messaging.internetofthings.ibmcloud.com”;

Char publishTopic[] = “iot-2/evt/manimd/fmt/json”;

Char topic[] = “iot-2/cmd/led/fmt/String”;

Char authMethod[] = “use-token-auth”;

Char token[] = TOKEN;

Char clientId[] = “d:” ORG “:” DEVICE_TYPE “:” DEVICE_ID;

PubSubClient client(server, 1883, wifiClient);

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();
```

```
  }
}
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(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){
  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())) {
Serial.println(“Publish OK”);
}else {
Serial.println(“Publish FAILED”);
}
```

Output:




```
#include <WiFi.h>
#include <WiFiClient.h>
#include <PubSubClient.h>
const int trigPin = 5;
const int echoPin = 18;
//define sound speed in cm/uS
#define SOUND_SPEED 0.034
#define CM_TO_INCH 0.393701
long duration;
float distanceCm;
float distanceInch;


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

#define ORG "1qt6jn"//IBM ORGANITION ID
#define DEVICE_TYPE "banu"//Device type mentioned in ibm watson IOT Platform
#define DEVICE_ID "123"//Device ID mentioned in ibm watson IOT Platform
#define TOKEN "12345678"    //Token
String data3;



//-------- 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 even
char subscribetopic[] = "iot-2/cmd/test/fmt/String";// cmd  REPRESENT command
char authMethod[] = "use-token-auth";// authentication method
```