Team ID	PNT2022TMID05358
Project Name	Smart Waste Management System For Metropolitan Cities

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

WOKWI LINK:
https://wokwi.com/projects/348656632065950292

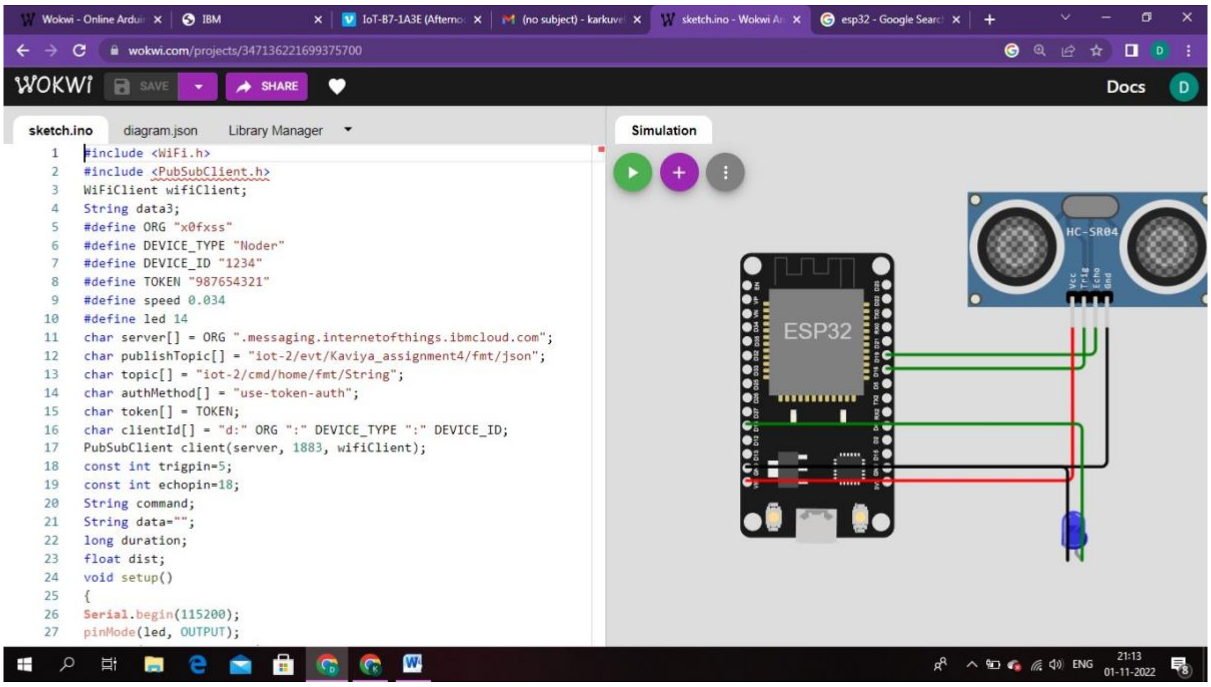
CODE:

```
#include <WiFi.h>
#include <PubSubClient.h>
WiFiClient wifiClient;
String data3;
#define ORG "x0fxss"
#define DEVICE_TYPE "Noder"
#define DEVICE_ID "1234"
#define TOKEN "987654321"
#define speed 0.034  #define led 14  char server[] = ORG
".messaging.internetofthings.ibmcloud.com";  char publishTopic[]
= "iot-2/evt/Kaviya_assignment4/fmt/json";  char topic[] = "iot-
2/cmd/home/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");
}
}  if(dist>100){
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 {
Serial.println("Publish FAILED");
}
}
}
```

OUTPUT:



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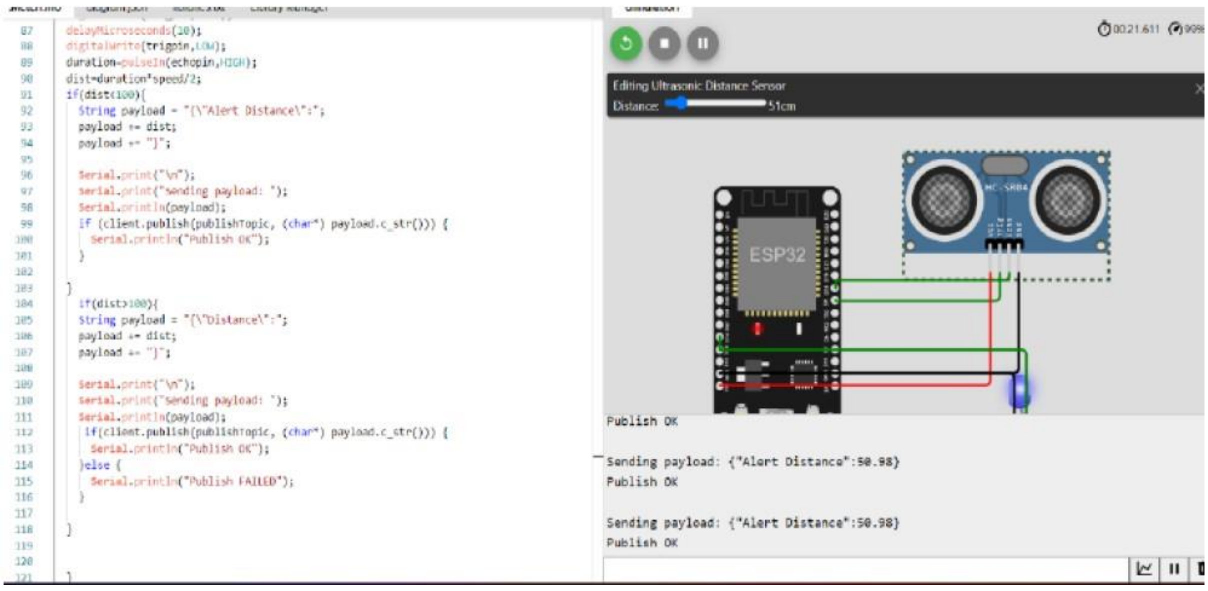
char publishTopic[] = "iot-2/evt/Kaviya_assignment4/fmt/json";
char topic[] = "iot-2/cmd/home/fmt/String";
char authMethod[] = "use-token-auth";
char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
PubSubClient client(server, 1883, wifiClient);
const int trigpin=5;
const int echopin=18;
String command;
String data="";
long duration;
float dist;
void setup()
{
Serial.begin(115200);
pinMode(led, OUTPUT);
```

A) When distance greater than 100 ,



```
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");
  }

}
  if(dist>100){
  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 {
    Serial.println("Publish FAILED");
  }

}

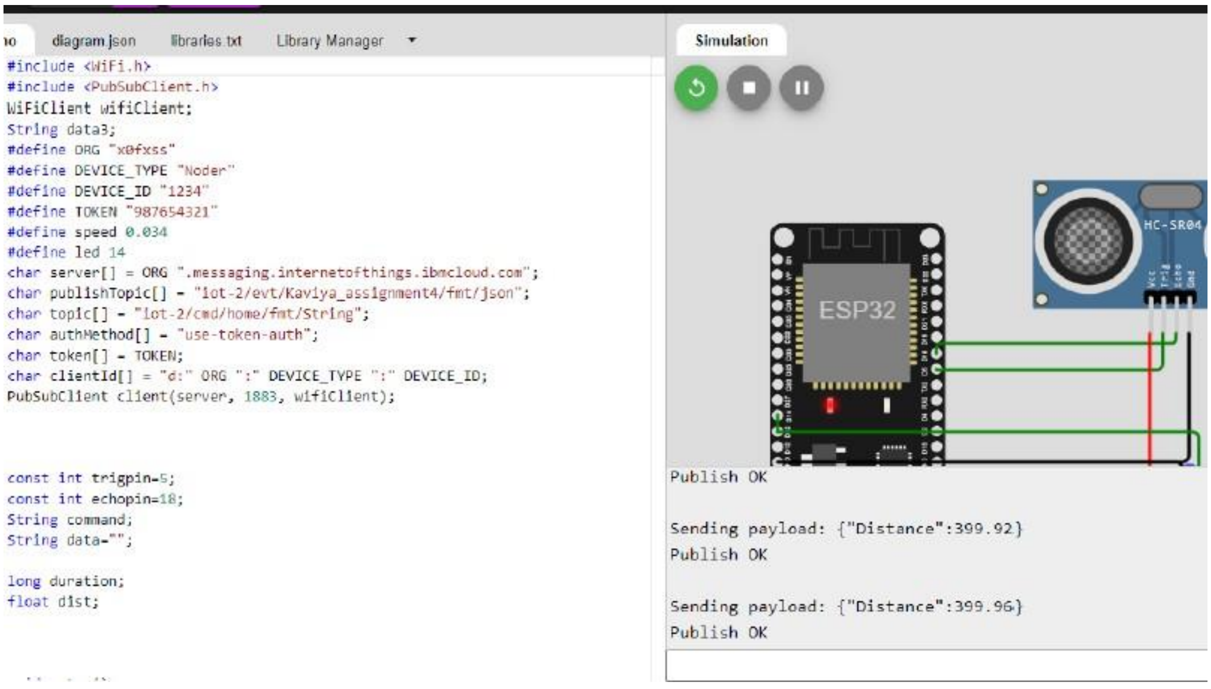

}
```

```
Publish OK

Sending payload: {"Alert Distance":50.98}
Publish OK

Sending payload: {"Alert Distance":50.98}
Publish OK
```

B) When distance less than 100 ,



```
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#include <PubSubClient.h>
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#define ORG "x0fxss"
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char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/evt/Kaviya_assignment4/fmt/json";
char topic[] = "iot-2/cmd/home/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;
```

```
Publish OK

Sending payload: {"Distance":399.92}
Publish OK

Sending payload: {"Distance":399.96}
Publish OK
```