# ASSIGNMENT 4

## 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.

## Code:

```
#include <WiFi.h>
#include <PubSubClient.h>
#define ECHO_PIN 2
#define TRIG_PIN 4
#define LED 5

//IBM credentials
#define ORG "pcfodk"
#define DEVICE_TYPE "IOT4"
#define DEVICE_ID "123"
#define TOKEN "123456789"

char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/evt/IoTSensor/fmt/json";
char subscribetopic[] = "iot-2/cmd/test/fmt/String";
char authMethod[] = "use-token-auth";
char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;


WiFiClient wifiClient;
PubSubClient client(server, 1883,wifiClient);
void setup(){
  Serial.begin(115200);
  pinMode(TRIG_PIN, OUTPUT);
  pinMode(ECHO_PIN, INPUT);
  pinMode(LED,OUTPUT);
  delay(10);
  Serial.println();
  wificonnect();
  mqttconnect();
}
```

```
float readDistanceCM() {
  digitalWrite(TRIG_PIN, LOW);
  delayMicroseconds(2);
  digitalWrite(TRIG_PIN, HIGH);
  delayMicroseconds(10);
  digitalWrite(TRIG_PIN, LOW);
  int duration = pulseIn(ECHO_PIN, HIGH);
  return duration * 0.034 / 2;
}
void loop(){
  float distance = readDistanceCM();
  bool isNearby = distance < 100;
  digitalWrite(LED, isNearby);
  Serial.print("Distance: ");
  Serial.println(distance);
  delay(100);
  if (isNearby == 1){
    PublishData(distance);
  }
  delay(1000);
  if (!client.loop()) {
    mqttconnect();
  }
}
void PublishData(float distance) {
  mqttconnect();
  String payload = "{\"Alert\":""\"";
  payload += distance;
  payload += " is less than 100cms\"";
  payload += "}";
  Serial.print("Sending payload: ");
  Serial.println(payload);
  if (client.publish(publishTopic, (char*) payload.c_str())) {
    Serial.println("Publish ok");
  }
  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(){
  Serial.println();
  Serial.print("Connecting to ");
  WiFi.begin("Wokwi-GUEST", "", 6);
  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");
  }
}
```

## Links:

## Wokwi link: [Wokwi Arduino and ESP32 Simulator]

## IBM Cloud: [IBM Watson IoT Platform (ibmcloud.com)]

# ScreenShots: