## **Assignment-4**

Assignment Date	30 October 2022
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Student Roll Number	AC19UCS138
Maximum Marks	2 Marks

Write code and connections in wokwi for ultrasonic sensors. Whenever distance is less than 100 cms send "alert" to ibm cloud and display in device recent events.

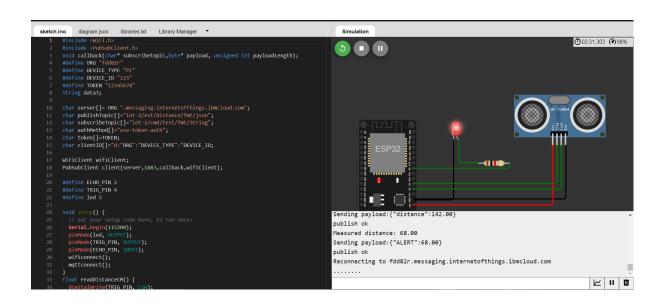
## **PROGRAM:**

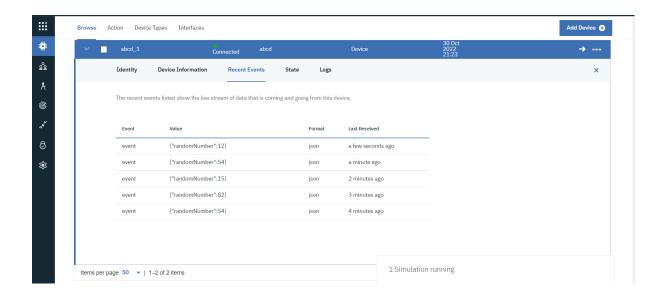
```
#include <WiFi.h>
#include < PubSubClient.h >
void callback(char* subscribe topic,byte* payload, unsigned int payloadLength);
#define ORG "fdd82r"
#define DEVICE TYPE "Pi"
#define DEVICE ID "123"
#define TOKEN "12345678"
String data3;
char server[]= ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[]="iot-2/evt/distance/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, callback, wifiClient);
#define ECHO PIN 2
#define TRIG PIN 4
#define led 5
void setup() {
 // put your setup code here, to run once:
 Serial.begin(115200);
 pinMode(led, OUTPUT);
 pinMode(TRIG PIN, OUTPUT);
 pinMode(ECHO PIN, INPUT);
 wifi connect();
 mqtt connect();
float readDistanceCM() {
```

```
digitalWrite(TRIG PIN, LOW);
 delayMicroseconds(2);
 digitalWrite(TRIG PIN, HIGH);
 delayMicroseconds(10);
 digitalWrite(TRIG PIN, LOW);
 int duration=random(1,200);
 //Serial.println(duration);
 //duration = pulseIn(ECHO PIN, HIGH);
 return duration;
 //Serial.println(duration);
}
void loop() {
 float distance = readDistanceCM();
 //Serial.println(distance);
 bool isNearby = distance < 100;
 digitalWrite(led, isNearby);
 Serial.print("Measured distance: ");
 Serial.println(distance);
 if(distance<100){
  PublishData2(distance);
 }else{
  PublishData1(distance);
 //PublishData(distance);
 delay(1000);
 if(!client.loop()){
  mqttconnect();
 //delay(2000);
void PublishData1(float dist){
 mqttconnect();
 String payload= "{\"distance\":";
 payload += dist;
 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 PublishData2(float dist){
 mqttconnect();
 String payload= "{\"ALERT\":";
 payload += dist;
 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 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");
void callback(char* subscribeTopic, byte* payload, unsigned int payloadLength){
 Serial.print("callback invoked for topic:");
 Serial.println(subscribeTopic);
 for(int i=0; i<payloadLength; i++){
  data3 += (char)payload[i];
 Serial.println("data:"+ data3);
 if(data3=="lighton"){
  Serial.println(data3);
  digitalWrite(led,HIGH);
 }else{
  Serial.println(data3);
  digitalWrite(led,LOW);
 data3="":
```





REFERENCE: https://wokwi.com/projects/346961481041969746