ASSIGNMENT – 4

Assignment date	**29 October 2022**
Project name	**Iot Based Smart Crop Protection System for Agriculture**
Team ID	**PNT2022TMID01702**
Maximum mark	**2 Marks**

QUESTION 1:

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

WOKWI LINK: https://wokwi.com/projects/347127533902234196

CODE:

```
#include <WiFi.h>
#include <PubSubClient.h>
 void callback(char* subscribetopic, byte* payload, unsigned int
payloadLength);
#define ORG "akptwo"
#define DEVICE_TYPE "ESP32_Controller"
#define DEVICE_ID "BME280_Sensor"
#define TOKEN "pySeb&4Lc@4tEHID(n"
String data3; float dist;
 char server[] = ORG
".messaging.internetofthings.ibmcloud.com"; char publishTopic[]
= "iot-2/evt/Data/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);
 int LED = 4;
int trig = 5;
int echo = 18;
void setup()
```

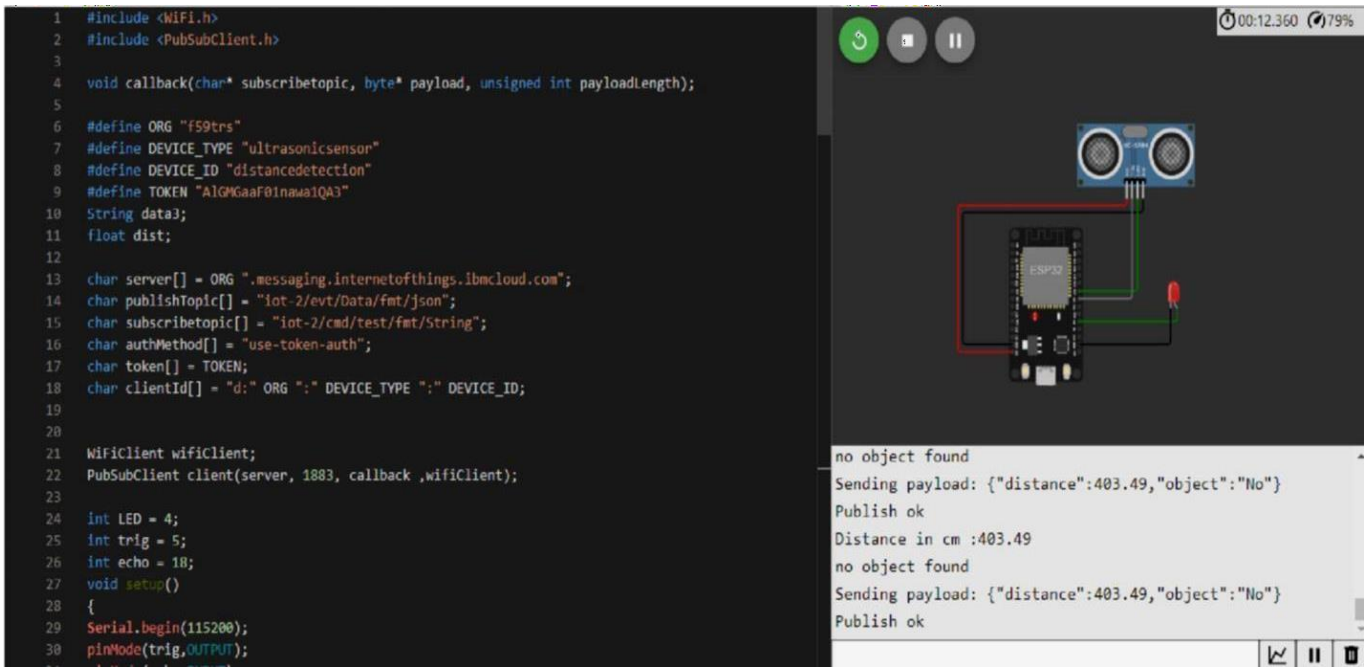
```
{
Serial.begin(115200);
pinMode(trig,OUTPUT);
pinMode(echo,INPUT);
pinMode(LED, OUTPUT);
delay(10);
wificonnect();
mqttconnect(); } void
loop()
{   digitalWrite(trig,LOW);
digitalWrite(trig,HIGH);
delayMicroseconds(10);
digitalWrite(trig,LOW);   float
dur = pulseIn(echo,HIGH);   float
dist = (dur * 0.0343)/2;
  Serial.print ("Distance in cm :");
  Serial.println(dist);

  PublishData(dist);
delay(1000);   if
(!client.loop()) {
mqttconnect();
  }
}
void PublishData(float dist) {
mqttconnect();   String
object;   if (dist <100)   {
    digitalWrite(LED,HIGH);
Serial.println("object is near");     object
= "Near";
  }
else   {
digitalW
rite(LED
,LOW);
Serial.p
rintln("
no
object
found");
object =
"No";
  }

  String payload = "{\"distance\":";
payload += dist;   payload += ","
```

```
"\"object\":\"";   payload +=
object;   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");
  }  }  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];
```

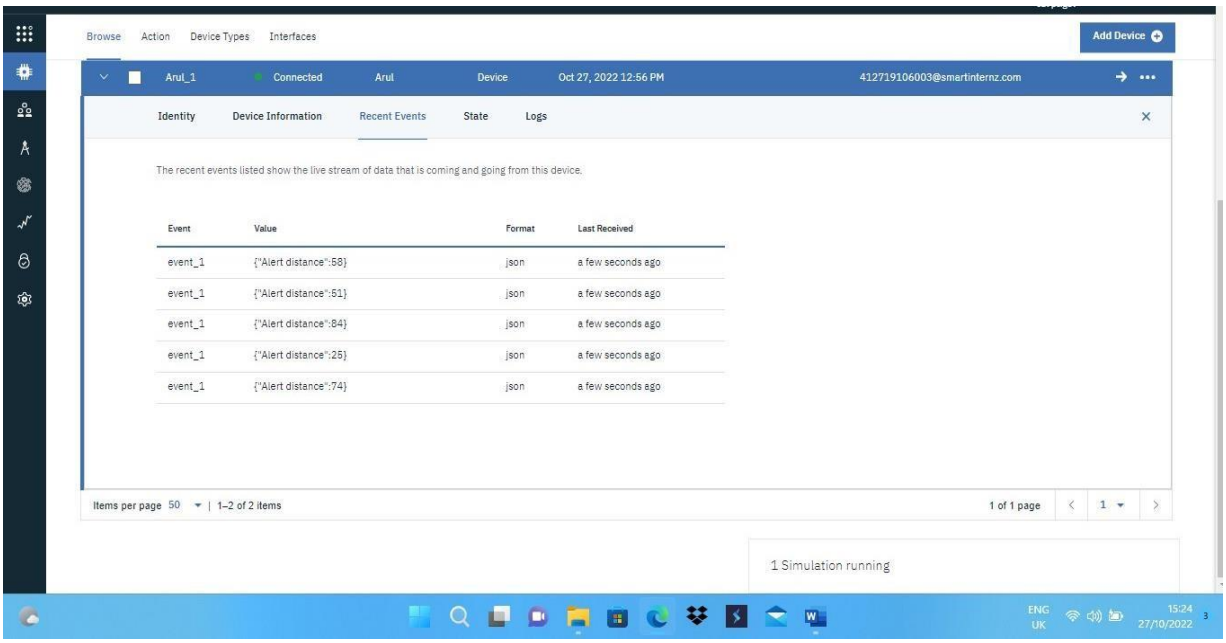
```
} data3="";
}
```

OUTPUT:

When object is nearer to Ultrasonic sensor



Data sent to the ibm cloud when the object is near


Browse
Action
Device Types
Interfaces
Add Device
Arul_1
Connected
Arul
Device
Oct 27, 2022 12:56 PM
412719106003@smartinternz.com
Identity
Device Information
Recent Events
State
Logs
The recent events listed show the live stream of data that is coming and going from this device.
Event
Value
Format
Last Received
event_1
{"Alert distance":58}
json
a few seconds ago
event_1
{"Alert distance":61}
json
a few seconds ago
event_1
{"Alert distance":84}
json
a few seconds ago
event_1
{"Alert distance":25}
json
a few seconds ago
event_1
{"Alert distance":74}
json
a few seconds ago
Items per page 50
1–2 of 2 items
1 of 1 page
1
1 Simulation running
ENG
UK
15:24
27/10/2022