

Assignment -4

Assignment Date	19 September 2022
Student Name	Mr. Arul.B
Student Roll Number	812419106006
Maximum Marks	2 Marks

Question-1:

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.

Upload document with wokwi share link and images of IBM cloud

Program:

```
#include <WiFi.h>

#include <PubSubClient.h>

void callback(char* subscribetopic, byte* payload, unsigned int payloadLength);

#define ORG "4sm1u8"

#define DEVICE_TYPE "arul2022"

#define DEVICE_ID "wowkiid"

#define TOKEN "lpdU1OM-8X0?Mmnwkf"

String data3;

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);

const int trigPin = 5;

const int echoPin = 18;

#define SOUND_SPEED 0.034

long duration;

float distance;
```

```

void setup() {
  Serial.begin(115200);
  pinMode(trigPin, OUTPUT);
  pinMode(echoPin, INPUT);
  wificonnect();
  mqttconnect();
}

void loop()
{
  digitalWrite(trigPin, LOW);
  delayMicroseconds(2);
  digitalWrite(trigPin, HIGH);
  delayMicroseconds(10);
  digitalWrite(trigPin, LOW);
  duration = pulseIn(echoPin, HIGH);
  distance = duration * SOUND_SPEED/2;
  Serial.print("Distance (cm): ");
  Serial.println(distance);
  if(distance<100)
  {
    Serial.println("ALERT!!");
    delay(1000);
    PublishData(distance);
    delay(1000);
    if (!client.loop()) {
      mqttconnect();
    }
  }
  delay(1000);
}

void PublishData(float dist) {
  mqttconnect();
  String payload = "{\\\"Distance\\\":";

```

```

payload += dist;

payload += ", \"ALERT!!\":\"\"Distance 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");

}

}

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];

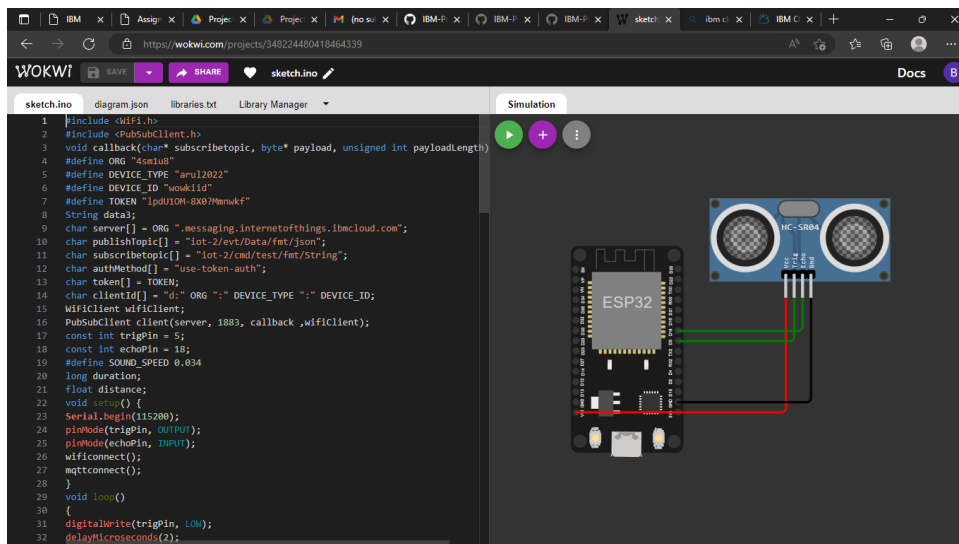
}

Serial.println("data: "+ data3);

data3="";

}

```



```
sending payload: {"Alert distance":93.99}
Publish OK

sending payload: {"Alert distance":93.96}
Publish OK

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The screenshot shows the IBM Watson IoT Platform dashboard. The top navigation bar includes tabs for Registration, My IBM, Service Details, IBM Watson, sketchino, and GitHub. The main header displays the URL `4sm1u8.internetofthings.ibmcloud.com/dashboard/devices/browse` and the user profile `arulbalasubramani2002@gmail.com` with ID `4sm1u8`.

The dashboard is divided into sections: Browse, Action, Device Types, and Interfaces. A sidebar on the left contains icons for various functions. The main content area shows a device named `wowkid` with status `Disconnected` and last update `13 Nov 2022 19:56`. Below this, a tabbed interface shows `Recent Events`.

The `Recent Events` tab displays a message: "The recent events listed show the live stream of data that is coming and going from this device." Below this message is a table with the following data:

Event	Value	Format	Last Received
event_1	{"Alertdistance":61}	json	a few seconds ago
event_1	{"Alertdistance":66}	json	a few seconds ago
event_1	{"Alertdistance":27}	json	a few seconds ago
event_1	{"Alertdistance":53}	json	a few seconds ago
event_1	{"Alertdistance":88}	json	a few seconds ago

At the bottom of the dashboard, a status bar indicates `1 Simulation running`. The Windows taskbar at the very bottom shows the search bar, task icons, system tray with weather (26°C Haze), and the date/time (10:55 AM 11/17/2022).