Assignment -4

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

CODE 1 :

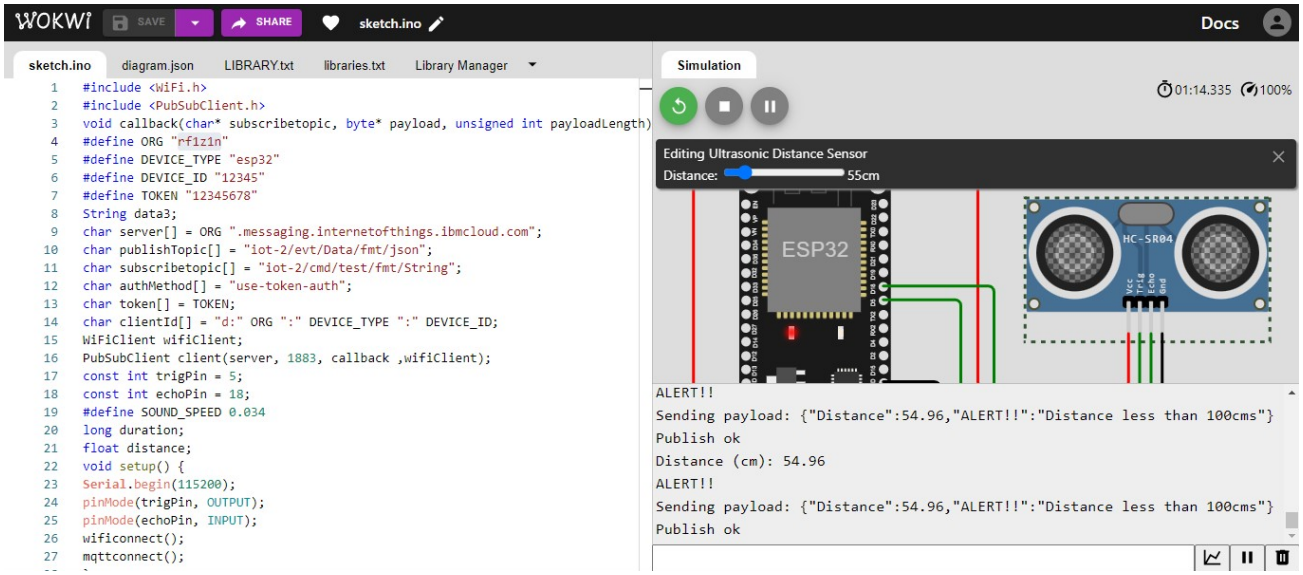
```
#include <WiFi.h>
#include <PubSubClient.h>   void callback(char* subscribetopic, byte*
payload, unsigned int payloadLength);
   #define ORG "rf1z1n"
#define DEVICE_TYPE "esp32"
#define DEVICE_ID "12345"
#define TOKEN "12345678" String data3; char server[] =
ORG ".messaging.internetofthings.ibmcloud.com"; 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="";
}
```

Wokwi Link :

https://wokwi.com/projects/347205982600823378

Output and Simulation :

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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();
```

Whenever the distance is less than 100 cms send an "alert" to the IBM cloud and display in the device recent events.