

Assignment -4

Student name	G.Sivanantham
Student rollnumber	821719104032
Maximum mark	2mark

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 :

```
#include <WiFi.h>
#include <PubSubClient.h> void callback(char* subscribetopic, byte* payload, unsigned int
payloadLength);

#define ORG " j3bgcj"
#define DEVICE_TYPE "esp32" #define
DEVICE_ID "1234"
#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");
} }

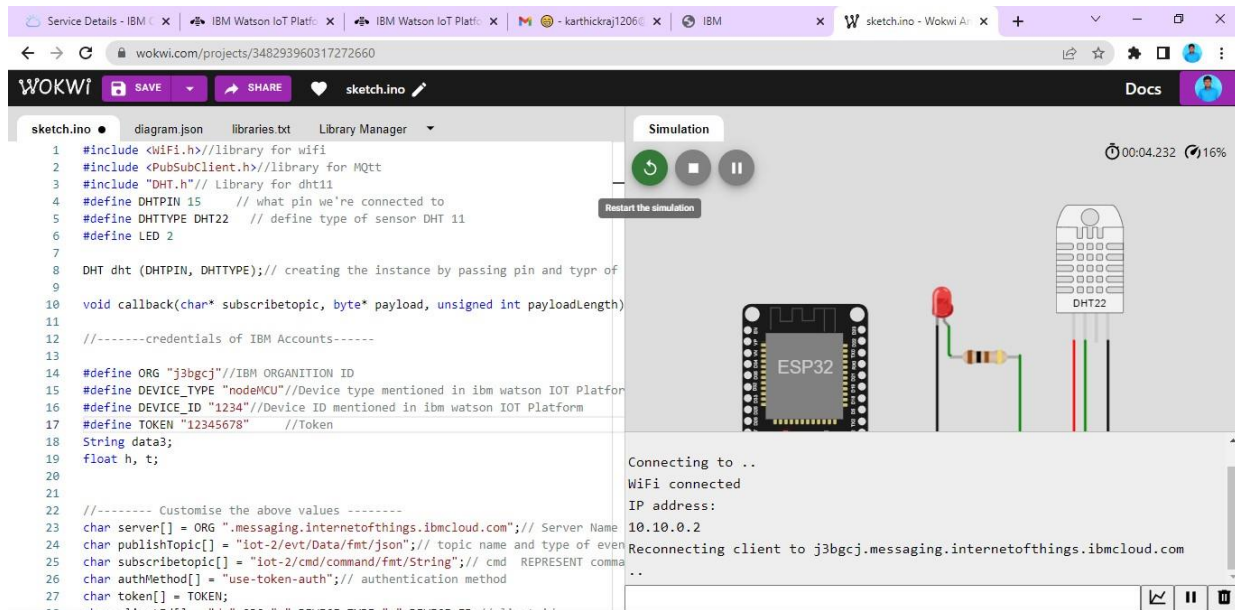
```

```
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/348293960317272660>

Output and Simulation :



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

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j3bgcj.internetofthings.ibmcloud.com/dashboard/devices/browse

IBM Watson IoT Platform karthickraj1206@gmail.com ID: j3bgcj

Browse

Action

Device Types

Interfaces

Add Device +

Search by Device ID

Device Simulator ☐

<input type="checkbox"/>	Device ID	Status	Device Type	Class ID	Date Added	
<input checked="" type="checkbox"/>	1234	Connected	nodeMCU	Device	Nov 13, 2022 2:00 PM	→ ...

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
status	{"name":"Train1","lat":17.6248626,"lon":78.472...	json	a few seconds ago
status	{"name":"Train1","lat":17.6340889,"lon":78.474...	json	a few seconds ago
status	{"name":"Train1","lat":17.6341908,"lon":78.474...	json	a few seconds ago
status	{"name":"Train1","lat":17.6387448,"lon":78.475...	json	a few seconds ago