

Assignment -4

Assignment Date	14 November 2022
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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

Wowki link: <https://wokwi.com/projects/347280270780531283>

Program:

```
#include <WiFi.h>
```

```
#include <PubSubClient.h>
```

```
#include <ArduinoJson.h>
```

WiFiClient wificlient:

```
#define ORG "tubusr"
```

```
#define DEVICE_TYPE "Evangs151"
```

```
#define DEVICE_ID "trainingid"
```

```
#define TOKEN "vqHfrv0*Jf3RB5hcJ8"
```

```
#define speed 0.034
```

```
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
```

```
char publishTopic[] = "iot-2/evt/Data/fmt/json"; char topic[] =
```

```
"iot-2/cmd/home/fmt/String"; char authMethod[] = "use-token
```

```
auth"; char token[] = TOKEN; char clientId[] = "d:" ORG ":"
```

```
DEVICE_TYPE ":" DEVICE_ID; PubSubClient client(server,
```

```
1883, wifiClient); void publishData();
```

```
const int trigpin=5; const
```

```
int echopin=18; String
```

```
command;
```

```
String data="";
```

```
long duration; int
```

```
dist;
```

```
void setup()
```

```
{
```

```
  Serial.begin(115200);
```

```
  pinMode(trigpin, OUTPUT);
```

```
  pinMode(echopin, INPUT);
```

```
  wifiConnect(); mqttConnect();
```

```
}
```

```
void loop() {
```

```
  publishData();
```

```
  delay(500); if
```

```
  (!client.loop()) {
```

```
    mqttConnect();
```

```
  }
```

```
}
```

```
void wifiConnect() {
```

```
  Serial.print("Connecting to "); Serial.print("Wifi");
```

```
  WiFi.begin("Wokwi-GUEST", "", 6);
```

```
  while (WiFi.status() != WL_CONNECTED) {
```

```

delay(500);

Serial.print(".");
}

Serial.print("WiFi connected, IP address: "); Serial.println(WiFi.localIP());
}

void mqttConnect() { if
(!client.connected()) {

Serial.print("Reconnecting MQTT client to "); Serial.println(server);
while (!client.connect(clientId, authMethod, token)) {
Serial.print("."); delay(1000);

}
initManagedDevice();
Serial.println();
}
}

void initManagedDevice() {
if (client.subscribe(topic)) {

Serial.println(client.subscribe(topic));
Serial.println("subscribe to cmd OK");
} else {
Serial.println("subscribe to cmd FAILED");
}
}

void publishData()
{
digitalWrite(trigpin,LOW);
digitalWrite(trigpin,HIGH); delayMicroseconds(10);

digitalWrite(trigpin,LOW);
duration=pulseIn(echopin,HIGH);
dist=duration*speed/2; if(dist<100){

```

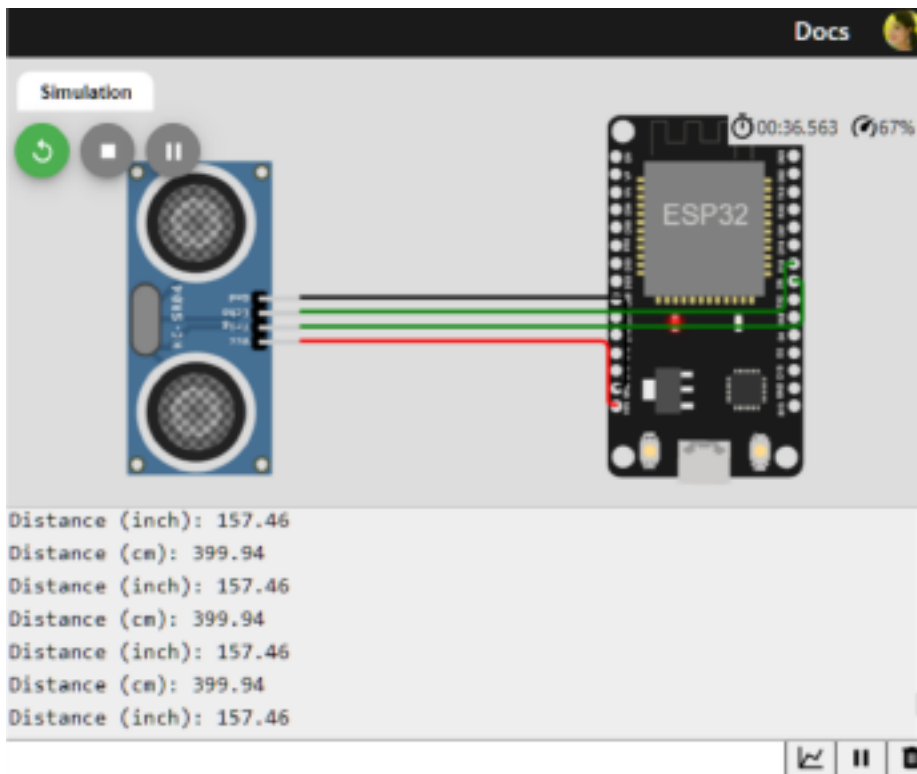
```

DynamicJsonDocument doc(1024);
String payload;
doc["AlertDistance:"]=dist;
serializeJson(doc, payload); delay(3000);

Serial.print("\n");
Serial.print("Sending payload: ");
Serial.println(payload);

if (client.publish(publishTopic, (char*) payload.c_str())) {
Serial.println("Publish OK");
} else {
Serial.println("Publish FAILED");
}
}
}
}

```



The screenshot shows the 'Recent Events' tab in the Azure IoT Hub interface. The interface has a top navigation bar with tabs: Identity, Device Information, Recent Events (selected), State, and Logs. Below the tabs, there is 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 columns: Event, Value, Format, and Last Received. The table contains five rows of data, all with the value '[\"AlertDistance\":51]' and the format 'json'. Below the table, it indicates '1 Simulation running'.

Event	Value	Format	Last Received
event_1	[\"AlertDistance\":51]	json	a few seconds ago
event_1	[\"AlertDistance\":56]	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\":50]	json	a few seconds ago

1 Simulation running