Assignmen
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Maximum Marks : 2 Marks

Project Name : IoT based safety gadget for child safety monitoring notification

Question :

Write a code and connections in wokwi for the ultrasonic sensor. Whenever the distance is less than 100cms send an “Alert” to IBM cloud and display in the device recent events.

Code:

```
#include
<WiFi.h>
#include
<PubSubClient.h>
void callback(char* subscribetopic, byte* payload,
unsigned int payloadLength);
//-------credentials of IBM Accounts------
#define ORG "kotoq5"//IBM ORGANITION ID
#define DEVICE_TYPE "ESP32"//Device type mentioned in ibm
watson IOT Platform#define DEVICE_ID "12345"//Device ID
mentioned in ibm watson IOT Platform #define TOKEN
"12345678" //Token
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(11
5200);
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("subscribeto 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++) {
```

```
//Serial.print((char)payload[i])
; data3 += (char)payload[i];
}
Serial.println("data: "+
data3);data3="";
}
```

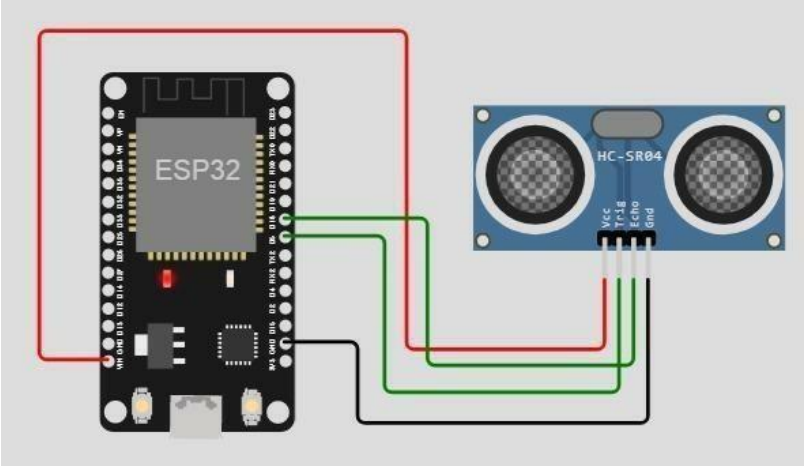
Diagram.json:

```
{
  "version": 1,
  "author":
  "sweetysharon
  ", "editor":
  "wokwi",
  "parts": [
    { "type": "wokwi-esp32-devkit-v1", "id": "esp", "top": -4.67, "left": -114.67,
    "attrs": {} },
    { "type": "wokwi-hc-sr04", "id": "ultrasonic1", "top": 15.96, "left": 89.17,
    "attrs": {} }
  ],
  "connections": [
    [ "esp:TX0", "$serialMonitor:RX", "", [] ],
    [ "esp:RX0",
    "$serialMonitor:TX", "", [] ],[
```

```
  "esp:VIN",
  "ultrasonic1
  :VCC"
  , "red",
  [ "h-37.16", "v-178.79", "h200", "v173.33", "h100.67" ]
],
[ "esp:GND.1", "ultrasonic1:GND", "black", [ "h39.87", "v44.04", "h170" ] ],
[ "esp:D5", "ultrasonic1:TRIG", "green", [ "h54.54", "v85.07", "h130.67" ] ],
[ "esp:D18", "ultrasonic1:ECHO", "green", [ "h77.87", "v80.01", "h110" ] ]
```

```
  ]
}
```

Circuit Diagram:



Output:

output:

```
Connecting to ....
WiFi connected
IP address:
10.10.0.2
Reconnecting client to ytluse.messaging.internetofthings.ibmcloud.com
iot-2/cmd/test/fmt/String
subscribe to cmd OK

Distance (cm): 399.92
Distance (cm): 399.96
Distance (cm): 399.94
Distance (cm): 399.98
Distance (cm): 399.94
Distance (cm): 399.92
Distance (cm): 399.94
```

IBM cloud output: