Assignment-4

Ultrasonic sensor simulation in Wokwi

Question:

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

Code:

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

voidcallback(char*subscribetopic,byte*payload,unsignedintpayloadLength);

//-------credentialsofIBMAccounts------

#defineORG"kotoq5"//IBMORGANITIONID

#defineDEVICE_TYPE"ESP32"//DevicetypementionedinibmwatsonIOTPlatform#define
DEVICE_ID "12345"//Device ID mentioned in ibmwatson IOT
Platform#defineTOKEN"12345678"//Token

Stringdata3;

charserver[]=ORG".messaging.internetofthings.ibmcloud.com";charpublishTopic[]="iot-
2/evt/Data/fmt/json";

charsubscribetopic[]="iot-2/cmd/test/fmt/String";charauthMethod[]="use-token-auth";

chartoken[]=TOKEN;

charclientId[]="d:"ORG":"DEVICE_TYPE":"DEVICE_ID;

WiFiClientwifiClient;

PubSubClientclient(server,1883,callback,wifiClient);constint trigPin =5;

const int echoPin = 18;#defineSOUND_SPEED0.034longduration;

floatdistance;voidsetup(){

Serial.begin(115200);pinMode(trigPin,OUTPUT);pinMode(echoPin,
INPUT);wificonnect();mqttconnect();

}

voidloop()
```

```
{
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);
}
voidPublishData(floatdist){mqttconnect();
Stringpayload="{\"Distance\":";payload+=dist;
payload+=",\"ALERT!!\":""\"Distancelessthan100cms\"";payload+= "}";
Serial.print("Sendingpayload:");
Serial.println(payload);
if(client.publish(publishTopic,(char*)payload.c_str())){
Serial.println("Publishok");
}else{
Serial.println("Publishfailed");
}
}
voidmqttconnect(){
if (!client.connected()) {Serial.print("Reconnectingclientto");Serial.println(server);
while(!!!client.connect(clientId,authMethod,token)){
Serial.print(".");delay(500);
```

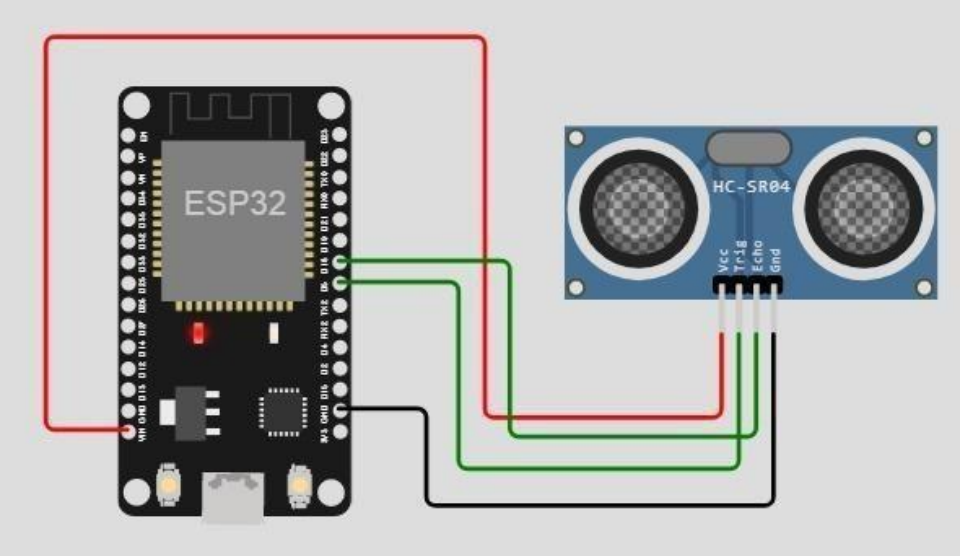
```
}
initManagedDevice();
Serial.println();
}
}
voidwificonnect()
{
Serial.println(); Serial.print("Connecting to ");WiFi.begin("Wokwi-GUEST", "", 6); while (WiFi.status() !=WL_CONNECTED){delay(500);
Serial.print(".");
}
Serial.println(""); Serial.println("WiFiconnected"); Serial.println("IP address: ");Serial.println(WiFi.localIP());
}
voidinitManagedDevice(){
if (client.subscribe(subscribetopic)) {Serial.println((subscribetopic)); Serial.println("subscribe tocmdOK");
}else{
Serial.println("subscribetocmdFAILED");
}
}
voidcallback(char*subscribetopic,byte*payload,unsignedintpayloadLength)
{
Serial.print("callbackinvokedfortopic:");
Serial.println(subscribetopic);
for(inti=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 Diagram:

```
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: