Assignment-4

Write code and connections in wokwi for ultrasonic sensor.

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

PROGRAM:

```
#include <WiFi.h>//library for wifi

#include <PubSubClient.h>//library

for MQtt #define ORG "q1wscz”

#define DEVICE_E

"sampledevice" #define

DEVICE_D "24052002

#define TOKEN

"K9)lI1C@tX6yO(J6L1" const int

T_PIN = 5;

const int E_PIN = 4;

char server[] = ORG ".messaging.internetofthings.ibmcloud.com";// Server Name

char publishTopic[] = "iot-2/evt/Data/fmt/json";// topic name and type of event perform and format in which data to be send

char subscribetopic[] = "iot-2/cmd/test/fmt/String";// cmd REPRESENT command type AND COMMAND IS TEST OF FORMAT STRING

char authMethod[] = "use-token-auth";//

authentication method char token[] = TOKEN;

char clientId[] = "d:" ORG ":" DEVICE_E ":" DEVICE_D;//client id
WiFiClient; // creating the instance for wificlient
---
PubSubClient client(server, 1883, wifiClient); //calling the predefined client id by passing parameter like server id,portand wificredential
void setup()
```

```
Serial.begin(115200)
; pinMode(T_PIN,
OUTPUT);
pinMode(E_PIN,
INPUT);
wificonnect();
mqttconnect();
  }
  float
   readDistanceCM()
   {
   digitalWrite(T_PIN
   , LOW);
   delayMicrosecond
   s(2);
   digitalWrite(T_PIN
   , HIGH);
   delayMicrosecond
   s(10);
   digitalWrite(T_PIN
   , LOW);
   int duration =
   pulseIn(E_PIN, HIGH);
   return duration * 0.034 /
   2;
  }
  void loop() {
```

```
 float distance =
 readDistanceCM();
 Serial.print("Measured
 distance: ");
 Serial.println(distance);
 if(distance<=100){
 PublishData(distance);
 }
 delay(1000);
 if
  (!client.lo
  op()) {
  mqttconn
  ect();
 }
}
void PublishData(float distance) {
mqttconnect();//function call for connecting to ibm
bool status=true;
String payload = "{\"ALERT_MESSAGE\":"; payload += status;
payload += "," "\"DISTANCE\":"; payload += distance;
payload += "}";

Serial.print("Sending payload: "); Serial.println(payload);
if (client.publish(publishTopic, (char*) payload.c_str())) {
Serial.println("Publish ok");// if it sucessfully upload data on the cloud
then it will print publish ok in Serial monitor or else it will print publish
failed
} else {
Serial.println("Publish failed");
```

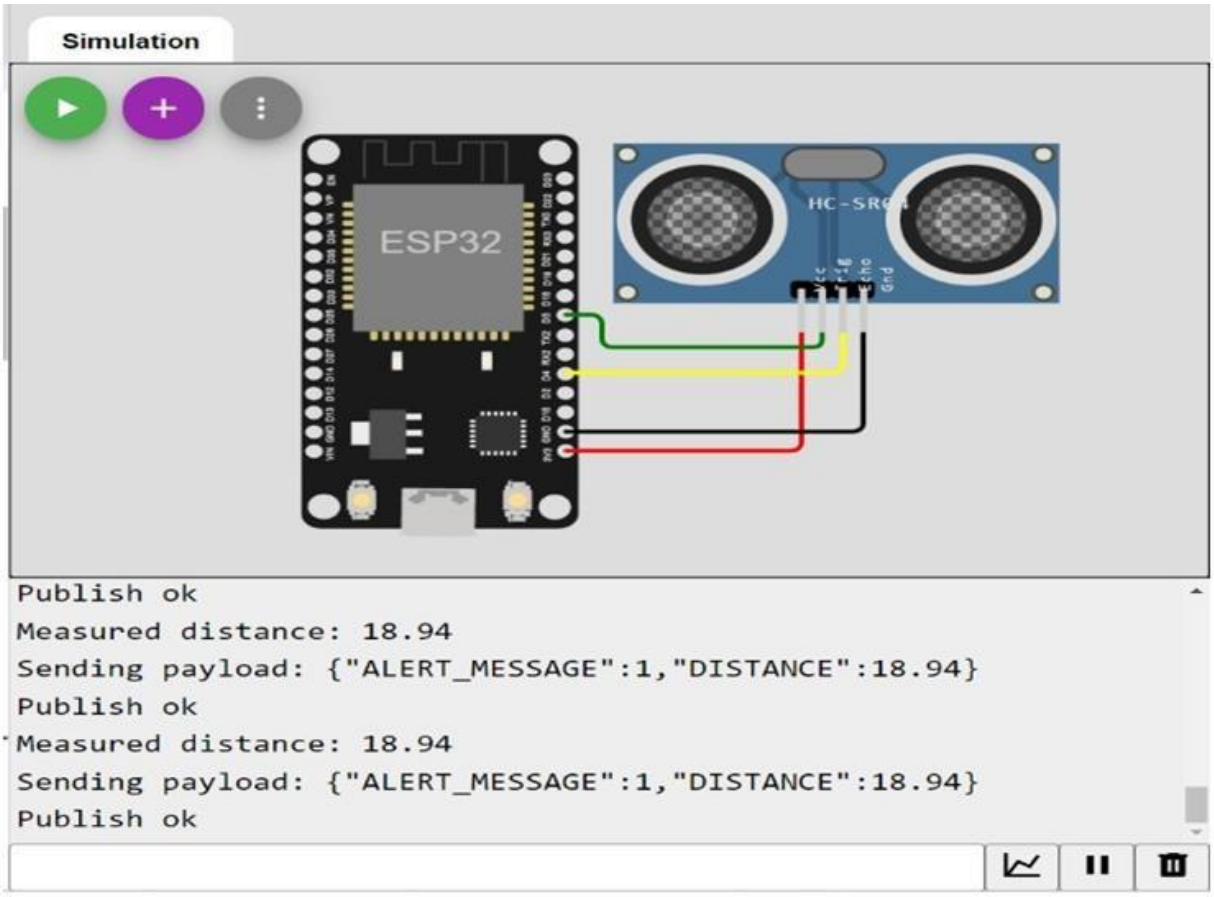
```
}


}
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() //function defination for wificonnect
{
Serial.println(); Serial.print("Connecting to ");

WiFi.begin("Wokwi-GUEST", "", 6);//passing the wifi credentials to
establish the connection
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");
}}
```

Output:


Simulation
ESP32
HC-SR04
Publish ok
Measured distance: 18.94
Sending payload: {"ALERT_MESSAGE":1,"DISTANCE":18.94}
Publish ok
Measured distance: 18.94
Sending payload: {"ALERT_MESSAGE":1,"DISTANCE":18.94}
Publish ok