Assignment -4

Assignment Date	08 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 cm send an "alert" to the IBM cloud and display in the device recent events.

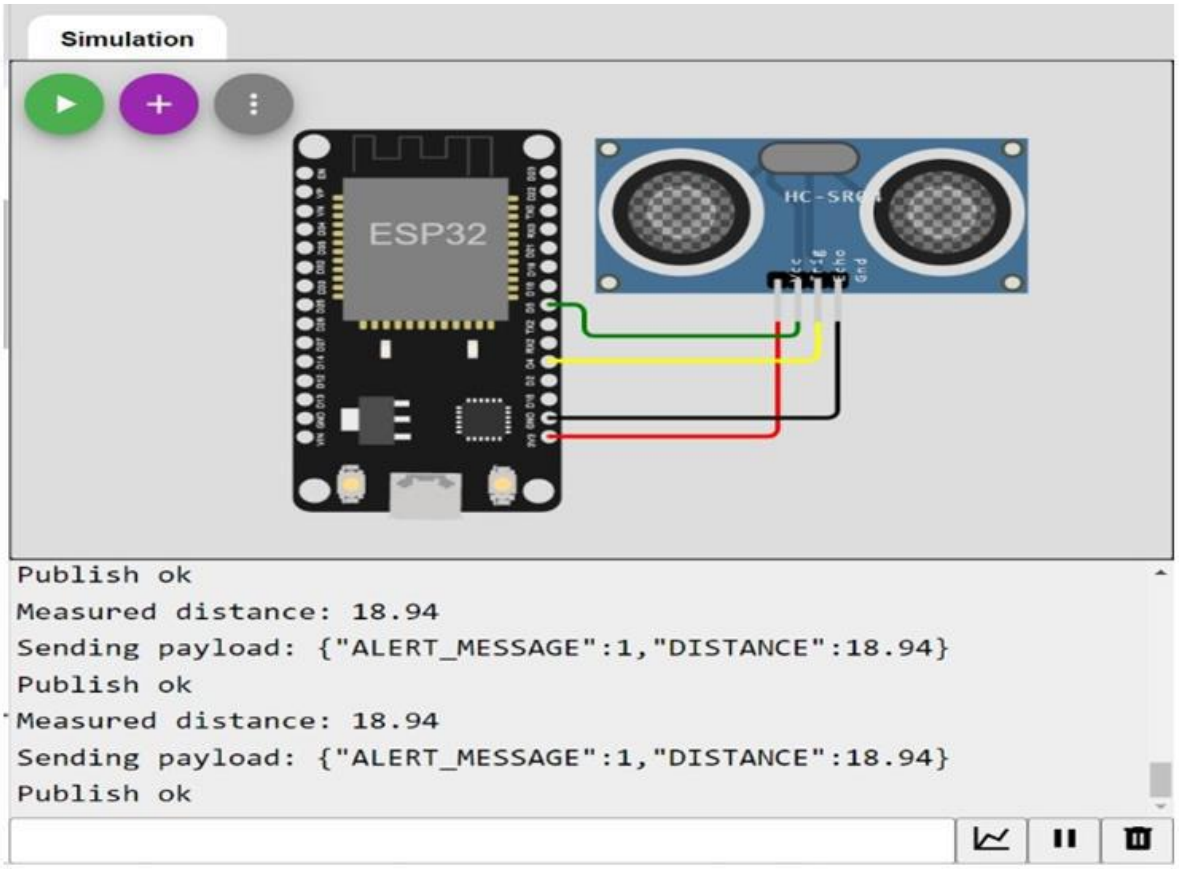
Solution:

```
#include <WiFi.h>
#include <PubSubClient.h>
#define DEVICE_E "sampledevice"
#define DEVICE_D "24052002
#define TOKEN "K9)lI1C@tX6yO(J6L1"
const int T_PIN = 5;
const int E_PIN = 4;

//-------- Customise the above values --------

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

// Server Name
 char publishTopic[] = "iot-2/evt/Data/fmt/json";

 char subscribetopic[] = "iot-2/cmd/test/fmt/String";

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

 char clientId[] = "d:" ORG ":" DEVICE_E ":" DEVICE_D;

 PubSubClient client(server, 1883, wifiClient);

 parameter like server id,portand wificredential

Serial.begin(115200);
pinMode(T_PIN, OUTPUT);
pinMode(E_PIN, INPUT);
wificonnect();
mqttconnect();
```

```
}

float readDistanceCM()
 {

digitalWrite(T_PIN, LOW);
delayMicroseconds(2);
digitalWrite(T_PIN, HIGH);
delayMicroseconds(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.loop()) {
mqttconnect();
}
}
void PublishData(float distance) {

mqttconnect();

/*
creating the String in in form JSon to update the data to ibm cloud
*/

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");
}
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");

}
}
```

OUTPUT:



IBM CLOUD IMAGE: