Assignment- 4

Ultrasonicsensorsimulationin Wokwi

AssignmentDate	27October2022
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MaximumMarks	2Marks

Question-1:

Writeacodeandconnectionsinwokwifortheultrasonicsensor.Wheneverthedistanceislessthan 100cmssendan“Alert”toIBM cloudanddisplayinthedevicerecentevents.

Code:

```
#include<WiFi.h>
#include<PubSubClient.h>
voidcallback(char*subscribetopic,byte* payload,unsignedint
payloadLength);
//-------credentials of IBM Accounts------
#define ORG "ytluse"//IBM ORGANITION ID
#define DEVICE_TYPE "2702"//Device type mentioned in ibmwatson IOT Platform
#define DEVICE_ID "12345"//Device ID mentioned in ibmwatson IOT Platform
#define TOKEN "O+n)Eh+lNX0y3?rG!8"//Token
String data3;
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);
constinttrigPin=5;
constintechoPin=18;
#define SOUND_SPEED 0.034
long duration;
float distance;
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): ");
```

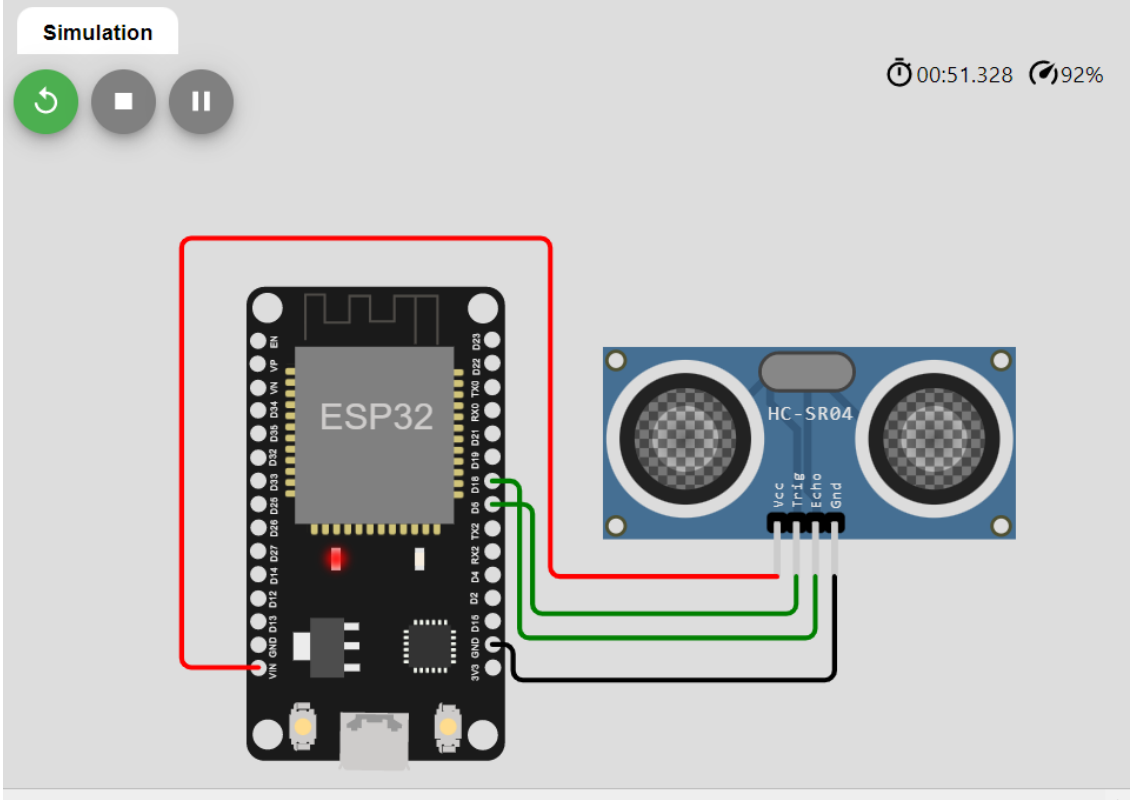
```
Serial.println(distance);
if(distance<100)
{
Serial.println("ALERT!!");
delay(1000);
PublishData(distance);
delay(1000);
if(!client.loop()){
mqttconnect();
}
}
delay(1000);
}
voidPublishData(floatdist){
mqttconnect();
String payload ="{\"Distance\":";
payload +=dist;
payload +=",\"ALERT!!\":""\"Distance 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");
}
}

voidmqttconnect(){
if(!client.connected()){
Serial.print("Reconnecting client to ");
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("WiFi connected");
Serial.println("IP address: ");
Serial.println(WiFi.localIP());
}
voidinitManagedDevice(){
if(client.subscribe(subscribetopic)){
Serial.println((subscribetopic));
Serial.println("subscribe to cmd OK");
}else{
Serial.println("subscribe to cmd FAILED");
```

```
}
}
voidcallback(char*subscribetopic,byte* payload,unsignedintpayloadLength)
{
Serial.print("callback invoked for topic: ");
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":"IRFANA FATHIMA A 19IT007",
  "editor":"wokwi",
  "parts":[
    {"type":"wokwi-esp32-devkit-v1","id":"esp","top":6,"left":-66,"attrs":{}},
    {"type":"wokwi-hc-sr04","id":"ultrasonic1","top":32.56,"left":81.02,"attrs":{}}
  ],
  "connections":[
    ["esp:TX0","$serialMonitor:RX","",[]],
    ["esp:RX0","$serialMonitor:TX","",[]],
    ["esp:VIN","ultrasonic1:VCC","red",["h-31.67","v-176.8","h152","v163.33"]],
    ["esp:D18","ultrasonic1:ECHO","green",["h11.37","v64.67","h121.33"]],
    ["esp:D5","ultrasonic1:TRIG","green",["h16.7","v45.07","h4"]],
    ["esp:GND.1","ultrasonic1:GND","black",["h8.7","v14.7","h138.67"]]
  ]
}
```

CircuitDiagram:

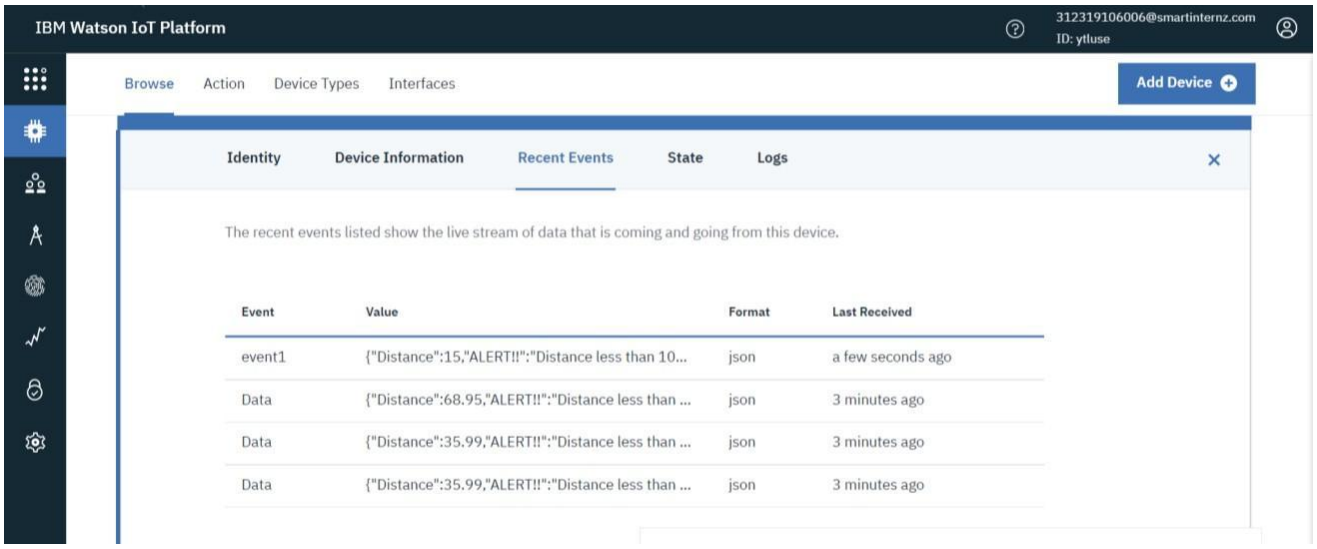


Output:

Wokwioutput:

```
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
```

IBMcloudoutput:



Wokwisimulationlink:

https://wokwi.com/projects/346458884229038675