Assignment-4

DistanceDetectionUsingUltrasonicSensor

AssignmentDate	27October2022
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MaximumMarks	2 Marks

Question-1:

Writecodeandconnectionsinwokwiforultrasonicsensor.Wheneverdistanceislessthan100cmssend"alert "toIBMcloudanddisplayindevicerecentevents.

WOKWILINK:https://wokwi.com/projects/346502216516895315

CODE:

```
#include<WiFi.h>//libraryforwifi#include
<PubSubClient.h>//libraryforMQtt


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

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

#defineORG"f59trs"//IBMORGANITION ID
#defineDEVICE_TYPE"ultrasonicsensor"//DevicetypementionedinibmwatsonIOTPlatform
#define DEVICE_ID "distancedetection"//Device ID mentioned in ibmwatson
IOTPlatform
#defineTOKEN"AlGMGaaF01nawa1QA3"
                                                    //Token
Stringdata3;
floatdist;


//--------Customisetheabovevalues--------
charserver[]=ORG".messaging.internetofthings.ibmcloud.com";//ServerName
charpublishTopic[]="iot-
2/evt/Data/fmt/json";//topicnameandtypeofeventperformandformatinwhichdatatobesend
charsubscribetopic[]="iot-2/cmd/test/fmt/String";//
cmdREPRESENTcommandtypeANDCOMMANDISTESTOFFORMATSTRING
charauthMethod[]="use-token-
auth";//authenticationmethodchartoken[]=TOKEN;charclientId[]=
"d:"ORG":"DEVICE_TYPE ":"DEVICE_ID;//clientid


//                                                  -
WiFiClientwifiClient;//creatingtheinstanceforwificlient
```

```
PubSubClientclient(server,1883, callback,wifiClient);
//callingthepredefinedclientidbypassingparameterlikeserverid,portandwificredential

int LED = 4;
inttrig=5;intecho=
18;voidsetup()
{
Serial.begin(115200);pin
Mode(trig,OUTPUT);pinM
ode(echo,INPUT);pinMod
e(LED,
OUTPUT);delay(10);
wificonnect();mqttconnect(
);
}
voidloop()//RecursiveFunction
{

  digitalWrite(trig,LOW);di
    gitalWrite(trig,HIGH);d
    elayMicroseconds(10);di
    gitalWrite(trig,LOW);
    floatdur=pulseIn(echo,HIGH);floatdist
    = (dur * 0.0343)/2;
    Serial.print("Distanceincm");Serial.printl
    n(dist);


    PublishData(dist);
    delay(1000);
    if (!client.loop())
        {mqttconnect();
    }
}



/* ..... retrievingto
Cloud ..... */

voidPublishData(floatdist) {mqttconnect();//functioncallfor
    connectingtoibm
    /*
          creatingtheStringininformJSonto updatethedatatoibmcloud
    */
    Stringobject;
```

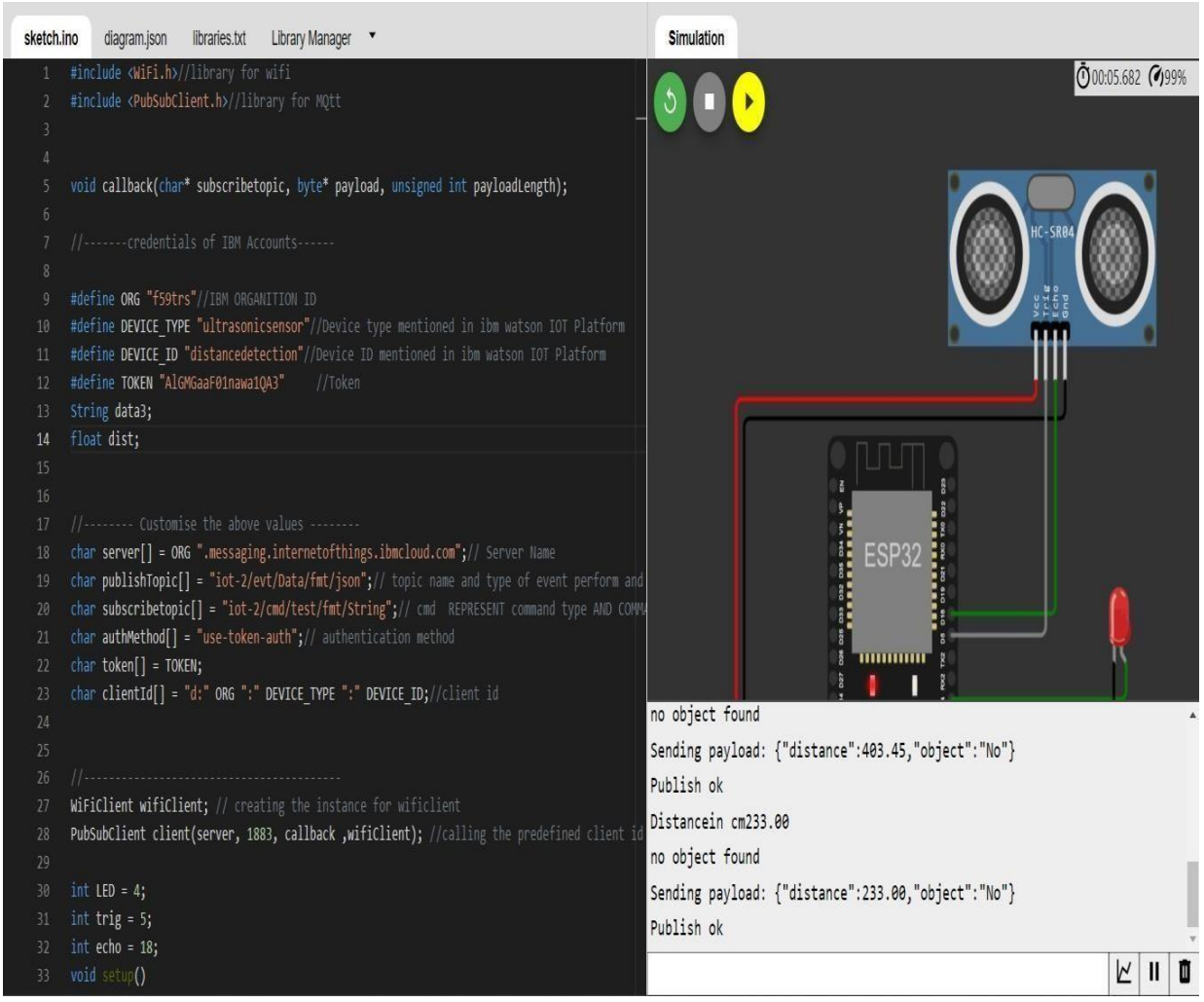
```
    if(dist<100)
    {
        digitalWrite(LED,HIGH);Serial.printl
        n("object is near");object ="Near";
    }
    else
    {
        digitalWrite(LED,LOW);
        Serial.println("noobjectfound");object="No";
    }

    String payload = "{\"distance\":";payload
    +=dist;
    payload += "," "\"object\":\"";payload
    +=object;
    payload+="\"}";


    Serial.print("Sendingpayload:");
    Serial.println(payload);




    if(client.publish(publishTopic,(char*)payload.c_str())){
        Serial.println("Publishok");//ifitsucessfullyuploaddataonthecloudthenit
willprintpublishokinSerialmonitororelseitwillprintpublishfailed
    }else{
        Serial.println("Publishfailed");
    }

}
voidmqttconnect(){
    if (!client.connected()) {
        Serial.print("Reconnectingclientto");Serial.printl
        n(server);
        while(!!!client.connect(clientId,authMethod,token)){
            Serial.print(".");
            delay(500);
        }

          initManagedDevice();
          Serial.println();
    }
}
```

```
voidwificonnect()//functiondefinationforwificonnect
{
  Serial.println();
  Serial.print("Connectingto");

  WiFi.begin("Wokwi-GUEST","",6);//passingthewificredentialstoestablishtheconnection
  while (WiFi.status() != WL_CONNECTED)
    {delay(500);
    Serial.print(".");
  }
  Serial.println("");
  Serial.println("WiFiconnected");Serial.pr
  intln("IP address:
  ");Serial.println(WiFi.localIP());
}

voidinitManagedDevice(){
  if (client.subscribe(subscribetopic)) {
    Serial.println((subscribetopic));Serial.println("subscribetocmdOK"
    );
  }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);
//        if(data3=="Near")
//        {
//Serial.println(data3);
//digitalWrite(LED,HIGH);

//        }

//        else
//        {
//Serial.println(data3);
```

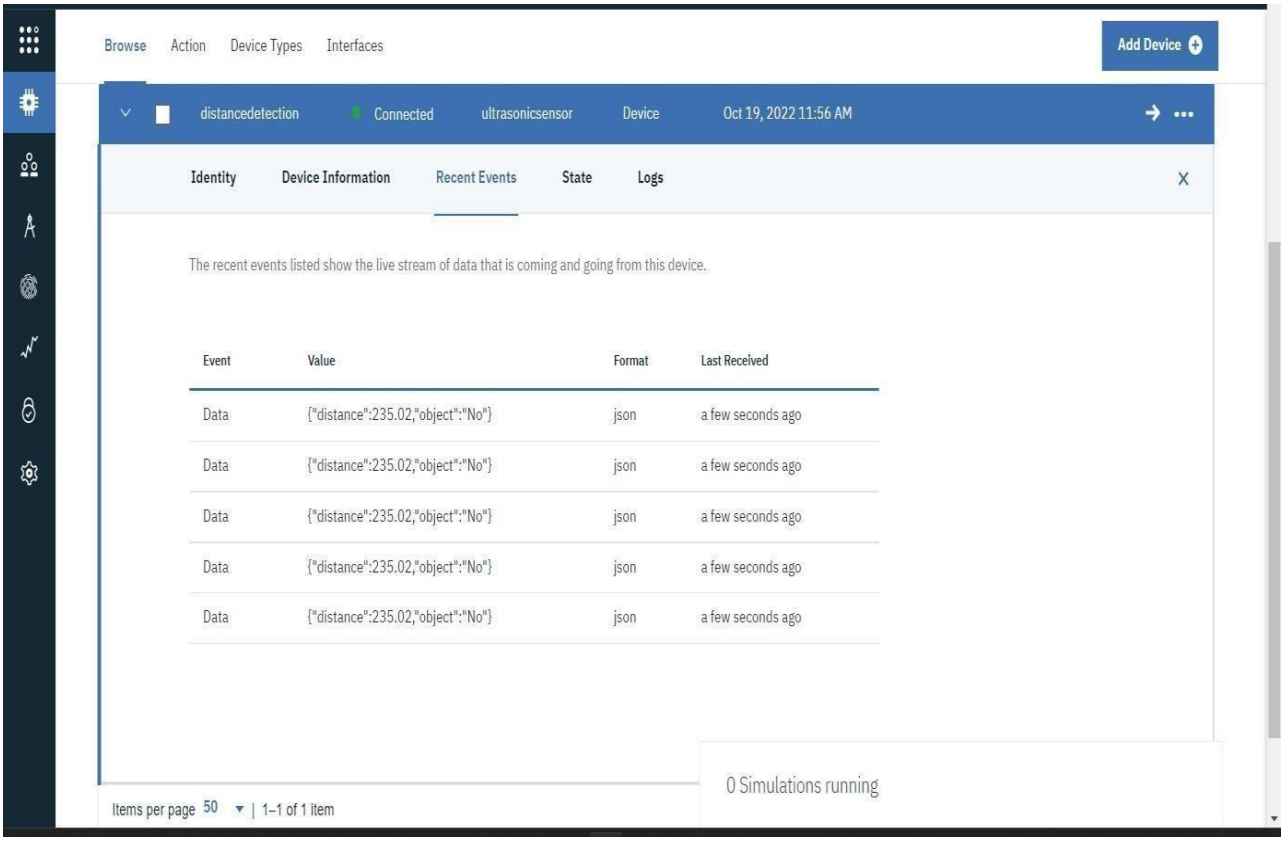
```
//digitalWrite(LED,LOW);

//
      }dat
a3="";
```

OUTPUT:

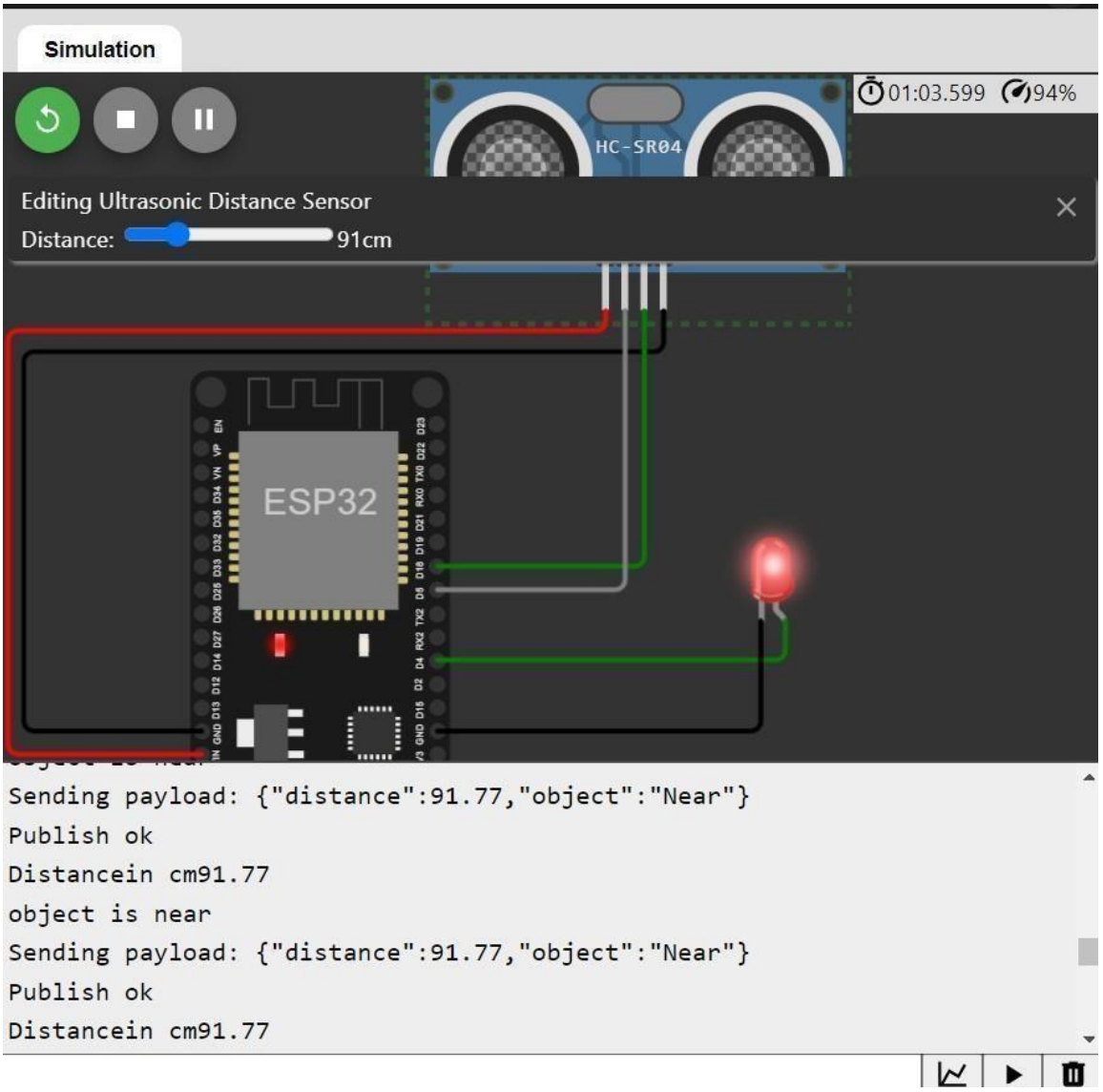
Whenobject isnotneartotheultrasonicsensor



Datasent totheIBMclouddevicewhentheobjectisfar



Whenobjectisnearertotheultrasonicsensor



DatasenttotheIBMclouddevicewhentheobjectisnear