Assignment-4

DistanceDetectionUsingUltrasonicSensor

AssignmentDate	19October2022
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MaximumMarks	2 Marks

Question-1:

Write code and connections in wokwi for ultrasonic sensor. Whenever distance is less than 100 cmssend"alert" toibmcloudanddisplay indevicerecentevents.

WOKWILINK:https://wokwi.com/projects/345964118720643668

CODE:

```
#include<WiFi.h>//library
forwifi#include<PubSubClient.h>//libraryfor
MQtt


voidcallback(char*subscribetopic,byte*payload,unsignedintpayloadL
ength);

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

#defineORG"f59trs"//IBMORGANITIONID
#defineDEVICE_TYPE"ultrasonicsensor"//Devicetypementionedinibmwat
sonIOTPlatform
#defineDEVICE_ID"distancedetection"//DeviceIDmentionedinibmwatson
IOTPlatform
#defineTOKEN"AlGMGaaF01nawa1QA3"
//TokenStringdata3;
floatdist;


//--------Customisetheabovevalues--------
char server[] = ORG
".messaging.internetofthings.ibmcloud.com";//ServerName
charpublishTopic[]="iot-2/evt/Data/fmt/json";//topicnameandtypeof
event perform andformatinwhich datatobesend
charsubscribetopic[]="iot-2/cmd/test/fmt/String";//
cmdREPRESENTcommandtypeANDCOMMANDIS TESTOFFORMATSTRING
charauthMethod[]="use-token-auth";//authenticationmethodchartoke
n[]=TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":"
DEVICE_ID;//clientid


//                                        -
WiFiClientwifiClient;//creating theinstanceforwificlient
```

```
PubSubClientclient(server,1883,callback,wifiClient);
//calling the predefined client id by passing parameter
likeserverid,portandwificredential

int LED =
4;int trig =
5;int echo =
18;voidsetup()
{
Serial.begin(115200);
pinMode(trig,OUTPUT);
pinMode(echo,INPUT);p
inMode(LED,
OUTPUT);delay(10);wif
iconnect();mqttconnec
t();
}
voidloop()//RecursiveFunction
{

 digitalWrite(trig,LOW);di
  gitalWrite(trig,HIGH);de
  layMicroseconds(10);digi
  talWrite(trig,LOW);
  float dur =
  pulseIn(echo,HIGH);float dist =
  (dur * 0.0343)/2;Serial.print
  ("Distancein
  cm");Serial.println(dist);


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



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

void PublishData(float dist)
  {mqttconnect();//functioncallforconnectingtoibm
  /*
     creating the String in in form JSon to update the data
toibmcloud
  */
  Stringobject;
```

```
  if(dist<100)
  {
    digitalWrite(LED,HIGH);Serial.pri
    ntln("object is
    near");object="Near";
  }
  else
  {
    digitalWrite(LED,LOW);Serial.print
    ln("no object found");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("Publish ok");// if it sucessfully upload
dataon the cloud then it will print publish ok in Serial monitor
orelseitwill printpublishfailed
  }else{
    Serial.println("Publishfailed");
  }

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

  WiFi.begin("Wokwi-GUEST", "", 6);//passing the wifi
credentialstoestablish theconnection
  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("subscr
    ibetocmdOK");
  }else{
    Serial.println("subscribetocmdFAILED");
  }
}

void callback(char* subscribetopic, byte* payload, unsigned
intpayloadLength)
{

  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);
```

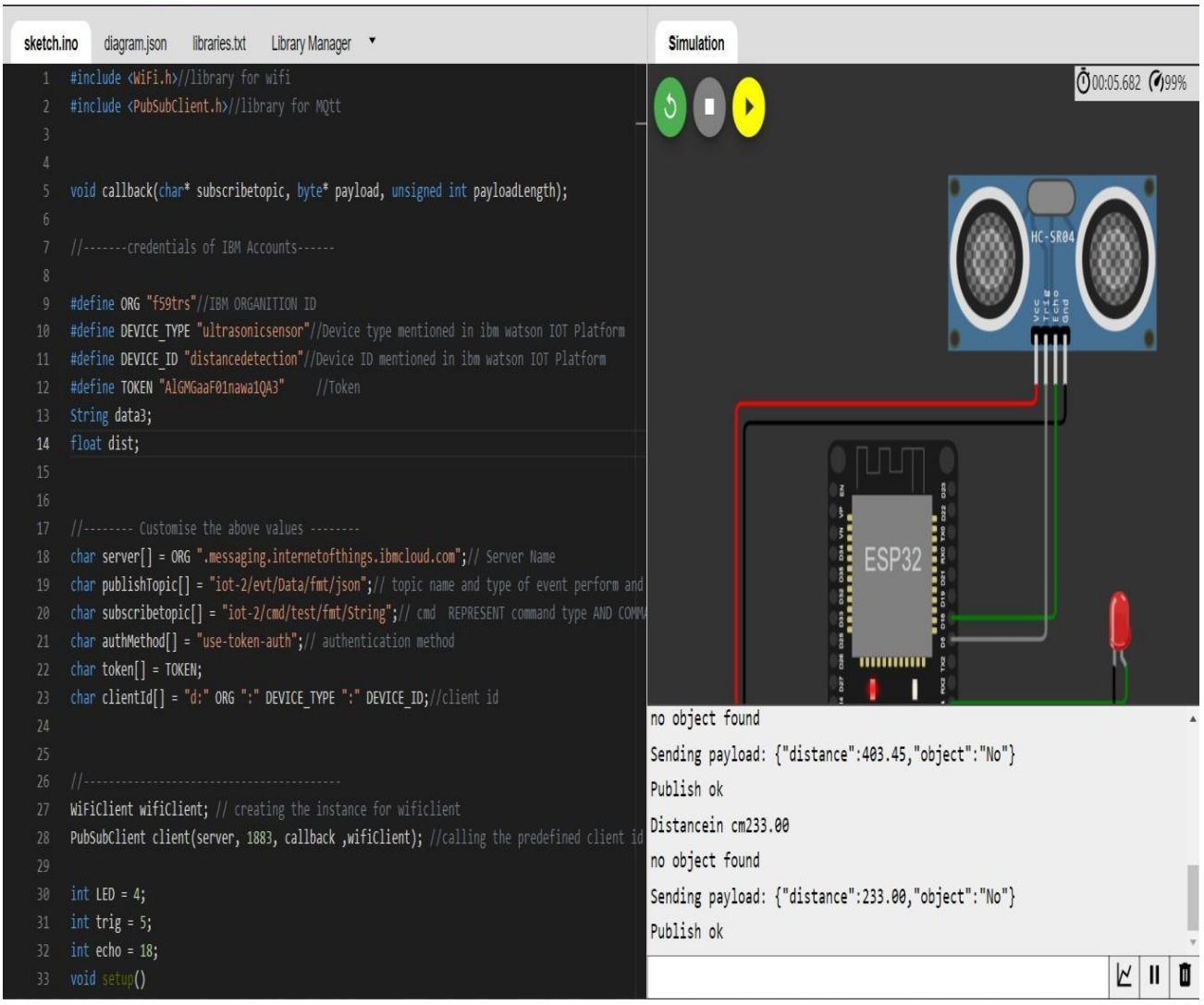
```
//digitalWrite(LED,LOW);

//
}data3=""
;
```

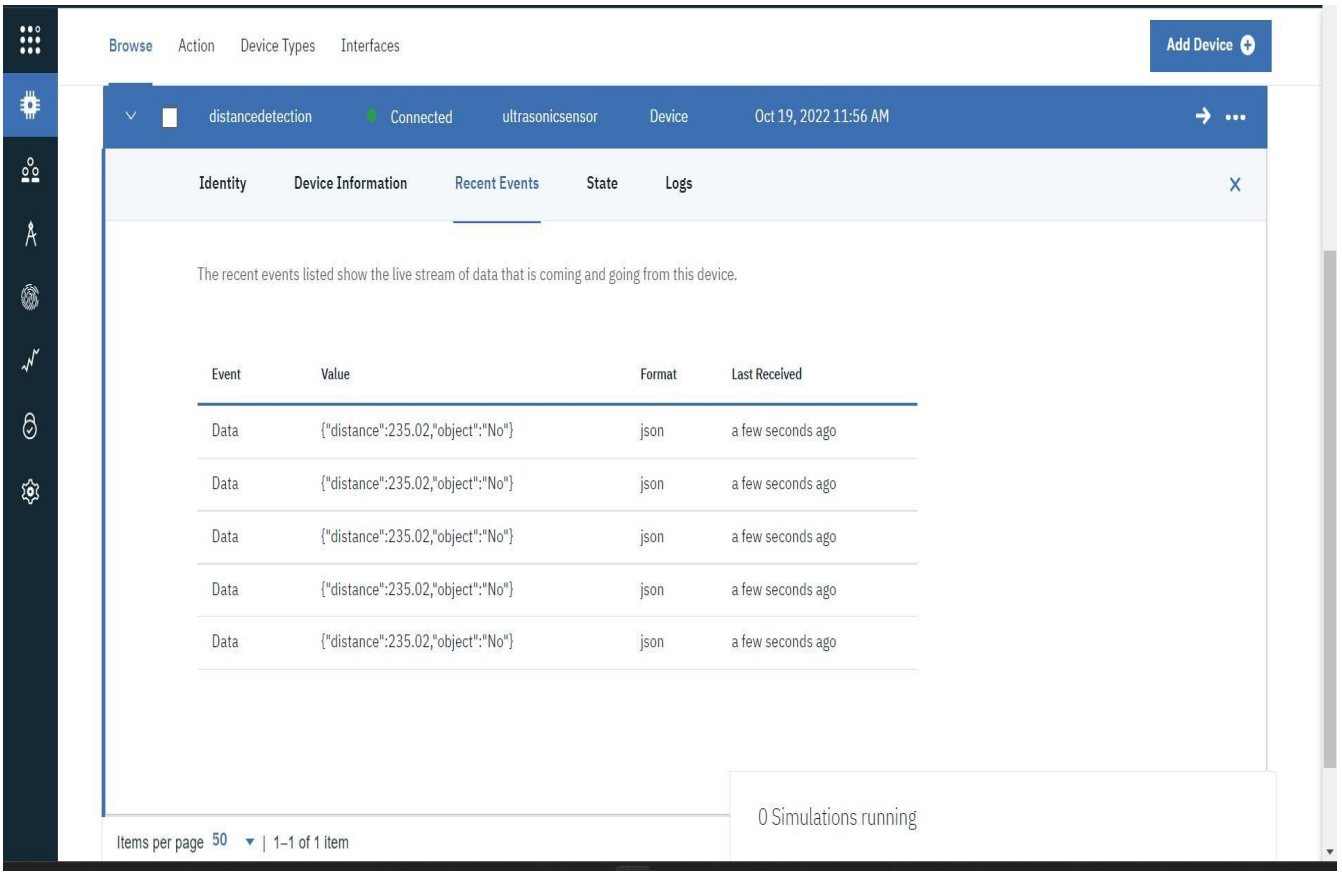
}

OUTPUT:

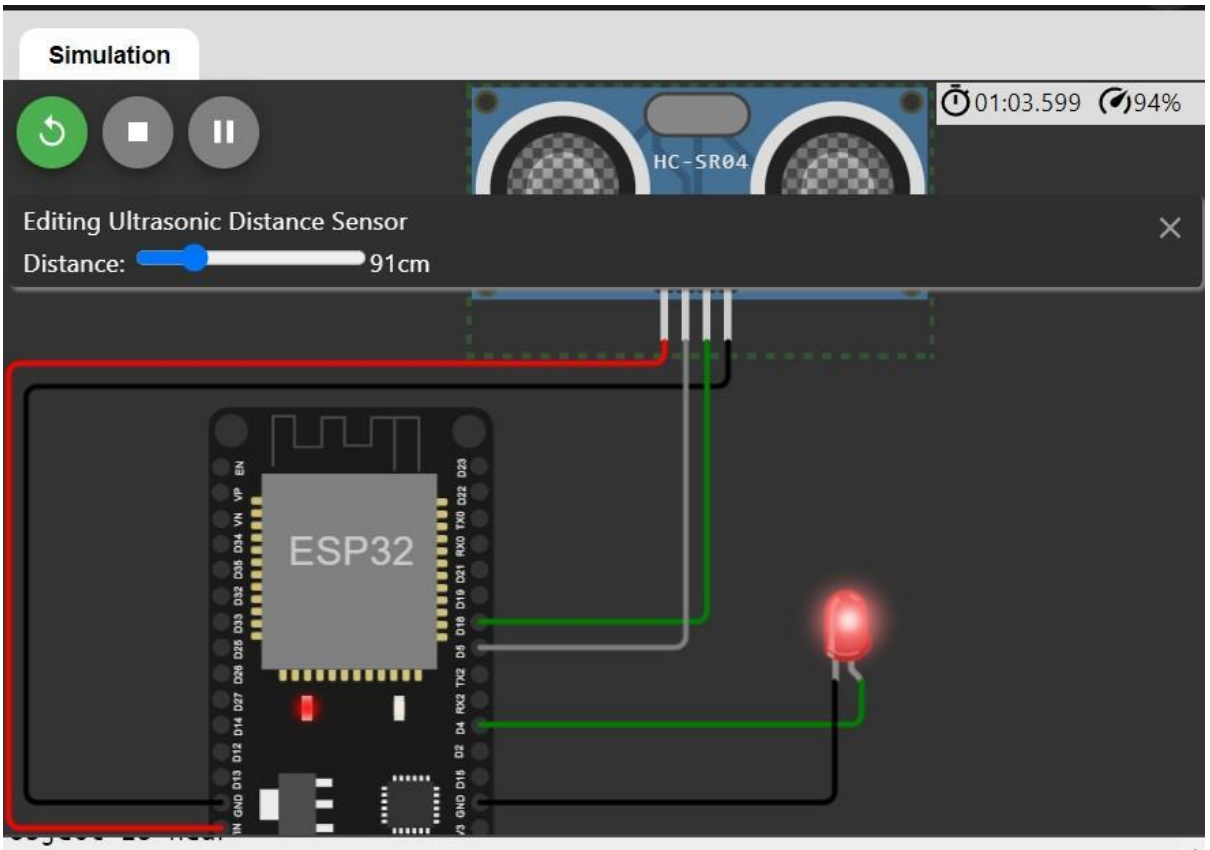
Whenobjectisnotneartotheultrasonicsensor



DatasenttotheIBMclouddevice whentheobjectis far

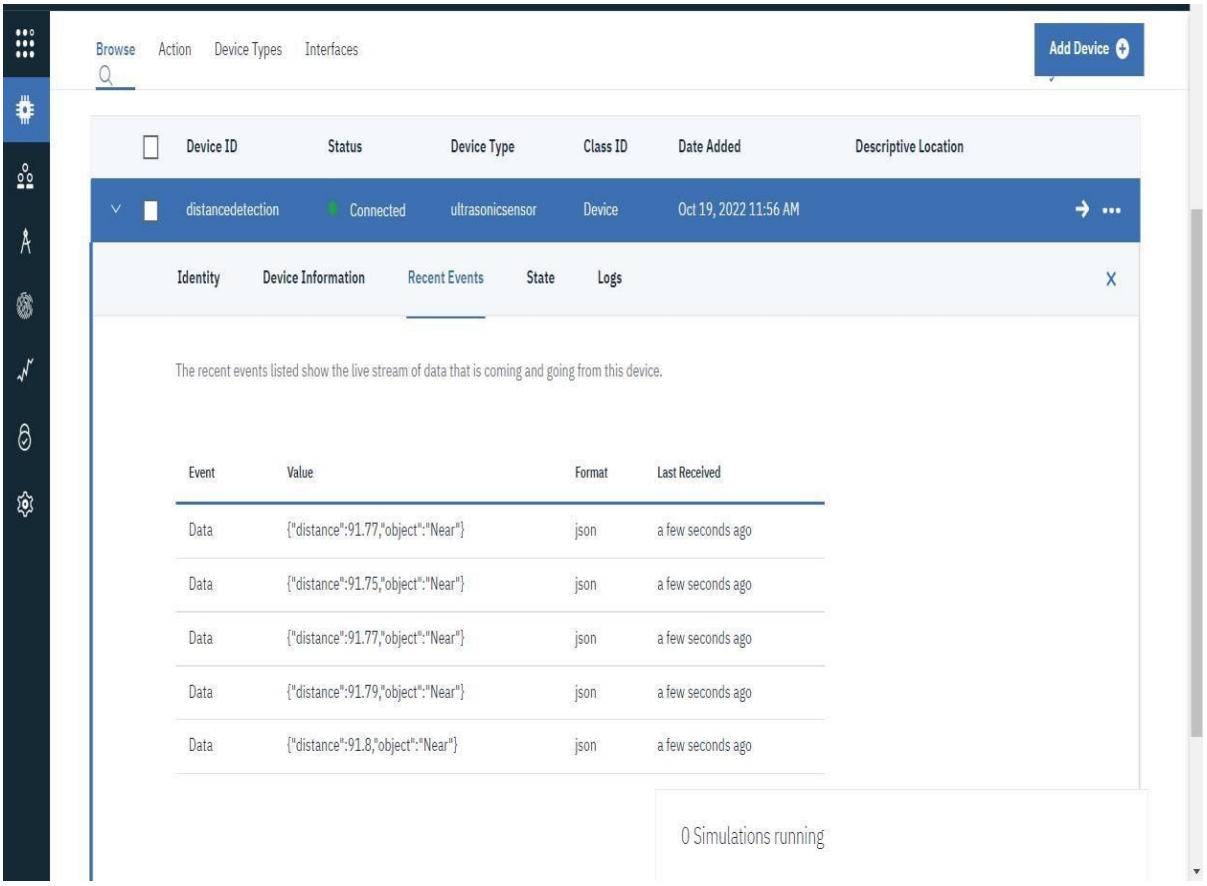


Whenobjectisnearertotheultrasonicsensor




```
Sending payload: {"distance":91.77,"object":"Near"}
Publish ok
Distancein cm91.77
object is near
Sending payload: {"distance":91.77,"object":"Near"}
Publish ok
Distancein cm91.77
```

DatasenttotheIBMclouddevice whentheobjectisnear



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