Assignment -4

Assignment Date	27 /10/2022
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Maximum Marks	2 Marks

Question-1:

Write code and connections in wokwi for ultrasonic sensor. Whenever distance is less 100 cms send “alert” to ibm cloud and display in device recent events.

Solution:

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

void callback(char* subscribetopic, byte* payload, unsigned int payloadLength);

//-------credentials of IBM Accounts------

#define ORG "za7x6f"//IBM ORGANITION ID
#define DEVICE_TYPE "rj46 "//Device type mentioned in ibm watson IOT Platform
#define DEVICE_ID "raj46 "//Device ID mentioned in ibm watson IOT Platform
#define TOKEN "R0Q4uhcOcCD0hnom)K"
//Token String data3; float dist;

//-------- Customise the above values -------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[] = "usetoken-
auth";// authentication method
```

```
char token[] = TOKEN; char clientId[] = "d:" ORG ":" DEVICE_TYPE

":" DEVICE_ID;//client id


//----------------------------------------

WiFiClient wifiClient; // creating the instance for wificlient

PubSubClient client(server, 1883, callback ,wifiClient); //calling the predefined client id by passing parameter like server id,portand wificredential


int LED = 4;

int trig = 5;

int echo =

18; void

setup()

{

Serial.begin(115200);

pinMode(trig,OUTPU

T);

pinMode(echo,INPUT

); pinMode(LED,

OUTPUT); delay(10);

wificonnect();

mqttconnect();

}

void loop()// Recursive Function

{

 digitalWrite(trig,LOW);

digitalWrite(trig,HIGH);

delayMicroseconds(10);

digitalWrite(trig,LOW);

float dur =
```

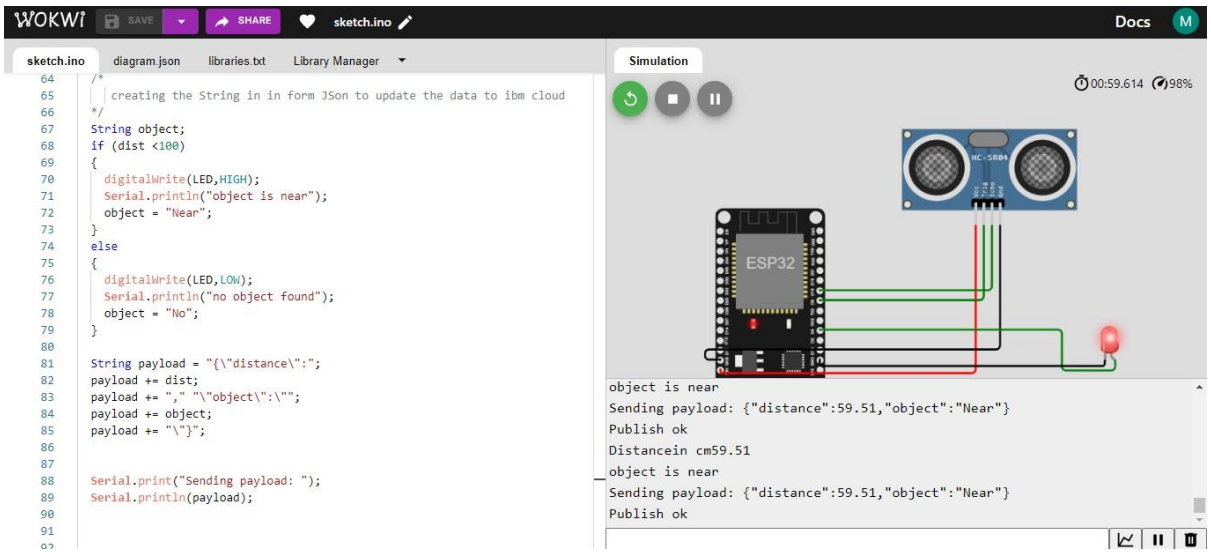
```
pulseIn(echo,HIGH);   float
dist = (dur * 0.0343)/2;
  Serial.print ("Distancein cm");
  Serial.println(dist);

PublishData(dist)
;   delay(1000);
if (!client.loop())
{
mqttconnect();
  }
}
/*.....retrieving to Cloud.....*/

void PublishData(float dist) {
mqttconnect();//function call for connecting to
ibm
  /*      creating the String in in form JSon to update the data to ibm
cloud
  */   String object;
if
(dist <100)
  {
    digitalWrite(LED,HIGH);
Serial.println("object is near");
object = "Near";
  }
else
{
digital
```

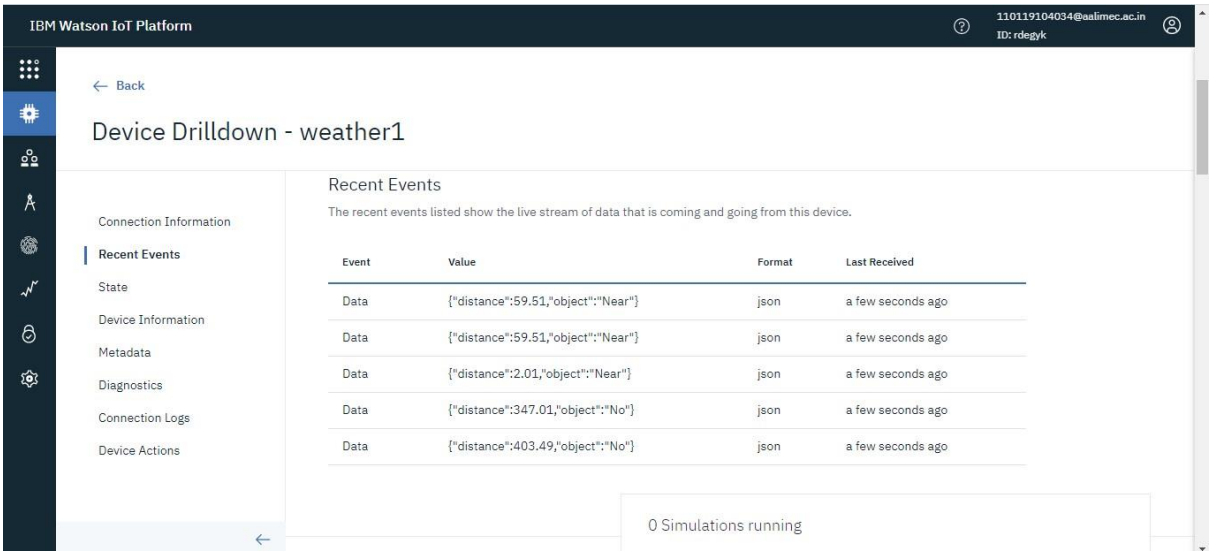
```
Write(
LED,
LOW)
;
Serial.
println
("no
object
found"
);
object
=
"No";
  }
  String payload =
"{\"distance\":";   payload +=
dist;   payload += ","
"\"object\":\""; payload +=
object;   payload += "\"}";
  Serial.print("Sending payload: ");
Serial.println(payload);   if
(client.publish(publishTopic, (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");
  } }
void callback(char* subscribetopic, byte* payload, unsigned int payloadLength)  {
```

```
  Serial.print("callback invoked for
topic: ");
Serial.println(subscribetopic);    for (int i
= 0; i < payloadLength; i++) {
//Serial.print((char)payload[i]);     data3
+= (char)payload[i];
  }
data3=""; }
```

Reference:
https://wokwi.com/projects/347322163482591827




IBM Watson IoT Platform
110119104034@aalimec.ac.in
ID: rdegyk
Back
Device Drilldown - weather1
Connection Information
Recent Events
State
Device Information
Metadata
Diagnostics
Connection Logs
Device Actions
Recent Events
The recent events listed show the live stream of data that is coming and going from this device.
Event
Value
Format
Last Received
Data
{"distance":59.51,"object":"Near"}
json
a few seconds ago
Data
{"distance":59.51,"object":"Near"}
json
a few seconds ago
Data
{"distance":2.01,"object":"Near"}
json
a few seconds ago
Data
{"distance":347.01,"object":"No"}
json
a few seconds ago
Data
{"distance":403.49,"object":"No"}
json
a few seconds ago
0 Simulations running