Assignment -4

Assignment Date	25 October 2022
Student Name	R. Sridhar
Student Roll Number	142219106104
Maximum Marks	2 Marks

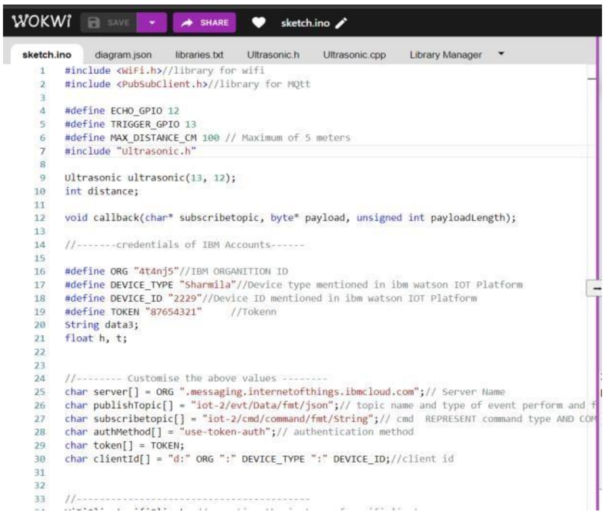
Question-1:

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

Upload document with wokwi share link and images of ibm cloud.

Solution:

```
#include <WiFi.h>//library for wifi
#include <PubSubClient.h>//library for MQtt
#define ECHO_GPIO 12
#define TRIGGER_GPIO 13
#define MAX_DISTANCE_CM 100 // Maximum of 5 meters
#include "Ultrasonic.h"

Ultrasonic ultrasonic(13, 12); int
distance;
 void callback(char* subscribetopic, byte* payload, unsigned int
payloadLength);
//-------credentials of IBM Accounts------

#define ORG "4t4nj5"//IBM ORGANITION ID
#define DEVICE_TYPE "Sharmila"//Device type mentioned in ibm watson IOT Platform
#define DEVICE_ID "2229"//Device ID mentioned in ibm watson IOT Platform
#define TOKEN "87654321"     //Tokenn
String data3; float h, t;

//-------- 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/command/fmt/String";// cmd  REPRESENT command type AND COMMAND IS TEST OF
FORMAT STRING
char authMethod[] = "use-token-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
void setup()// configureing the ESP32
{
  Serial.begin(115200);
delay(10);   Serial.println();
wificonnect();
mqttconnect();
}  void loop()// Recursive
Function
{    distance =
ultrasonic.read(CM);
if(distance < 100){
  Serial.print("Distance in CM: ");
  Serial.println(distance);
PublishData(distance);
delay(1000);   if
(!client.loop()) {
mqttconnect();
  }
  }
delay(1000);


}

/*....................................retrieving to
Cloud...............................*/
 void PublishData(float temp)
{
  mqttconnect();//function call for connecting to ibm
  /*      creating the String in in form JSon to update the data to ibm
cloud
  */
  String payload = "{\"Alert Distance:\":";
payload += temp;   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];
  }
  Serial.println("data: "+ data3);
  if(data3=="lighton")
{
Serial.println(data3);
}   else    {
Serial.println(data3);
} data3="";   }
```



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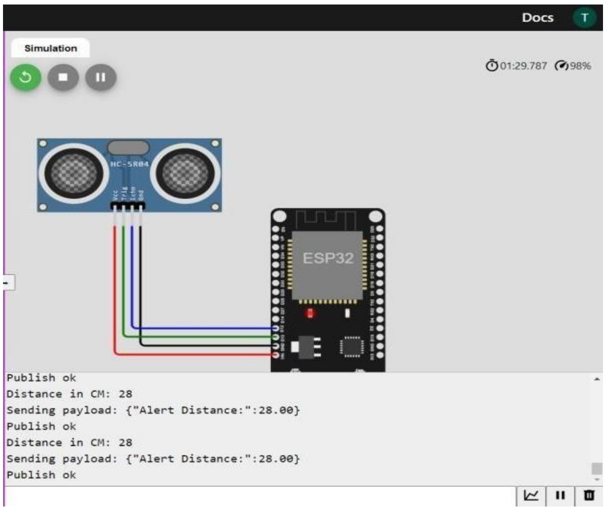
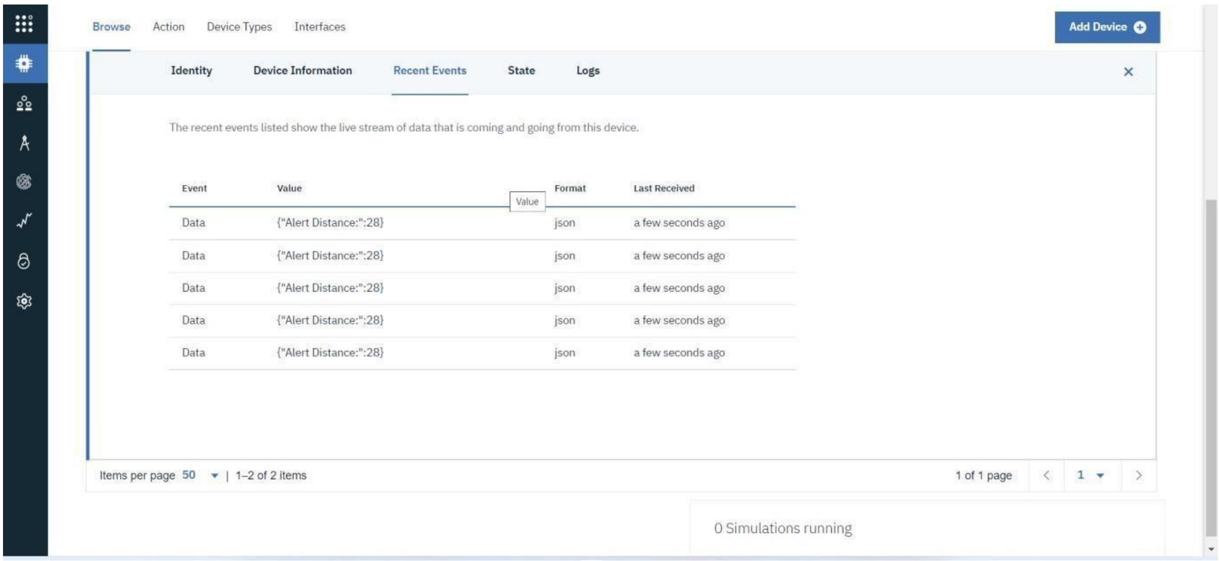


```
Publish ok
Distance in CM: 28
Sending payload: {"Alert Distance:":28.00}
Publish ok
Distance in CM: 28
Sending payload: {"Alert Distance:":28.00}
Publish ok
```



The recent events listed show the live stream of data that is coming and going from this device.

Event	Value	Format	Last Received
Data	{"Alert Distance:":28}	json	a few seconds ago
Data	{"Alert Distance:":28}	json	a few seconds ago
Data	{"Alert Distance:":28}	json	a few seconds ago
Data	{"Alert Distance:":28}	json	a few seconds ago
Data	{"Alert Distance:":28}	json	a few seconds ago

Wokwi share link:

https://wokwi.com/projects/347663953513415251