Assignment-4

Date	**28 October 2022**
Team ID	PNT2022TMID23797
Project Name	Real time river water quality monitoring and Control System
Maximum Marks	**4 Marks**

Question:

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

CODE:

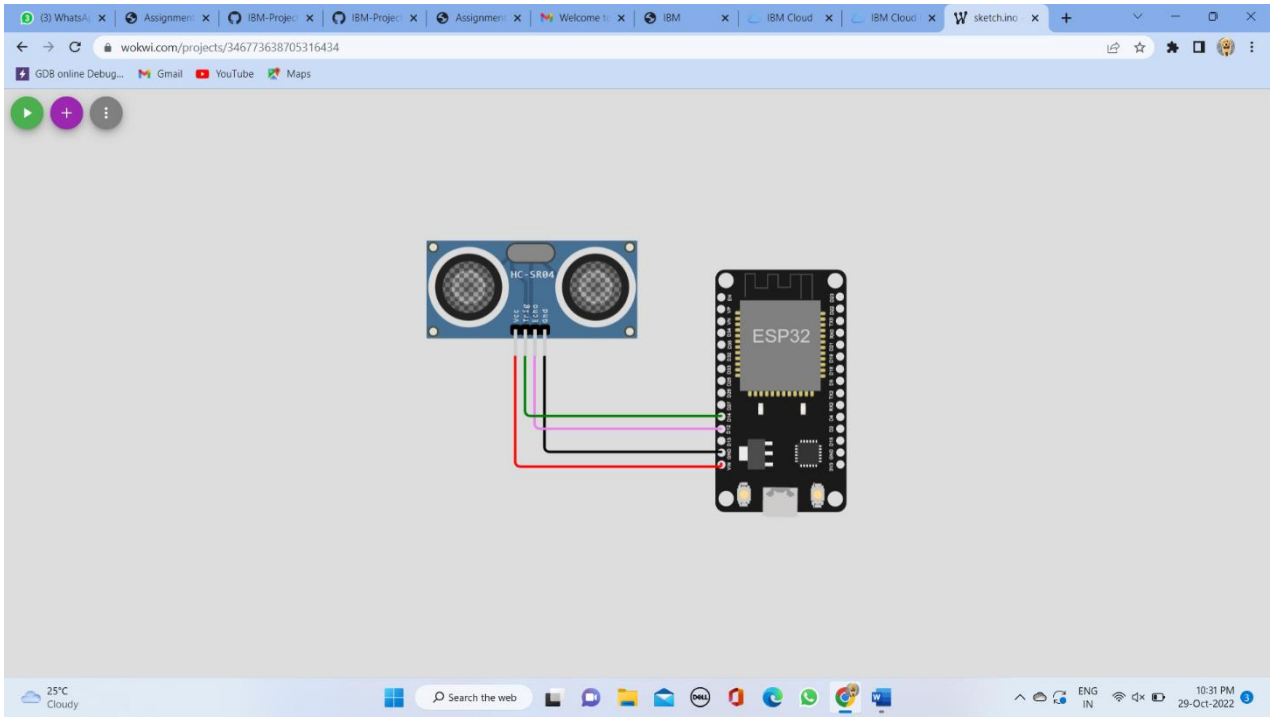
```
#include <WiFi.h>//library for wifi
#include <PubSubClient.h>//library for MQtt

#define ECHO_GPIO 12
#define TRIGGER_GPIO 14
#define MAX_DISTANCE_CM 100 // Maximum of 5 meters
#include "Ultrasonic.h"
Ultrasonic ultrasonic(14, 12);
int distance;
 void callback(char* subscribetopic, byte* payload, unsigned
int payloadLength);

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

#define ORG "q6sux6"//IBM ORGANITION ID
#define DEVICE_TYPE "ESP32"//Device type mentioned in ibm watson IOT Platform
#define DEVICE_ID "Devadharshinim11"//Device ID mentioned in ibm watson IOT
Platform
#define TOKEN "gp5PA9!jfw7jf9cV-g"
//Token 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 += "}";
```

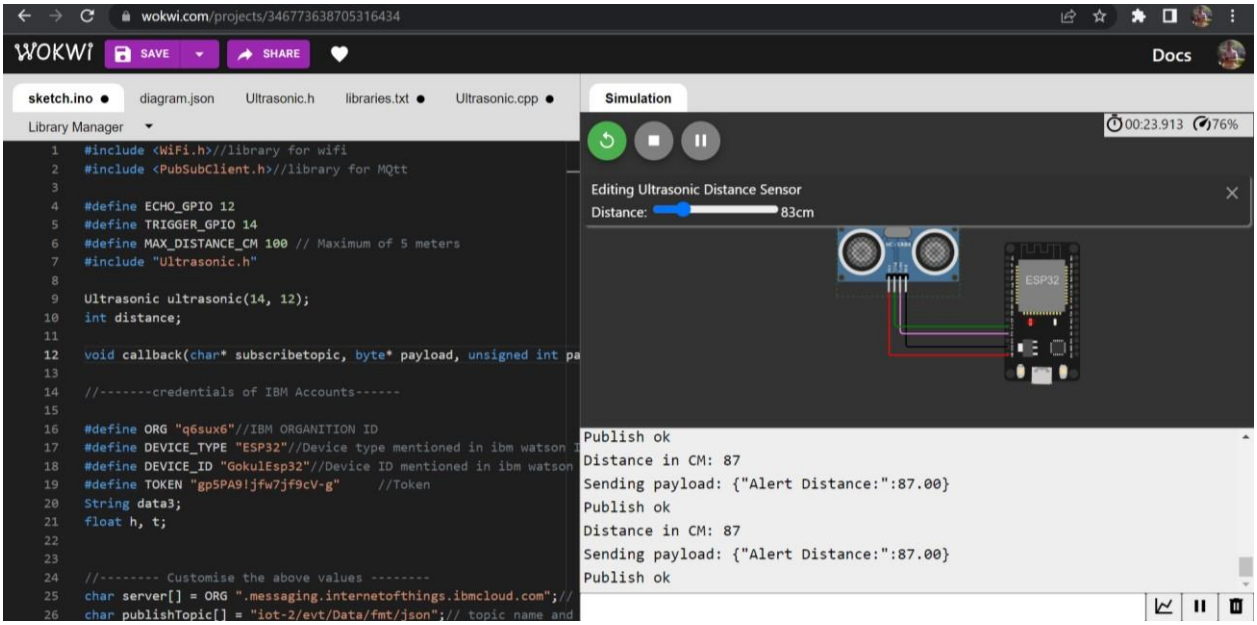
```
  Serial.print("Sending payload: ");
  Serial.println(payload);

  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");
```

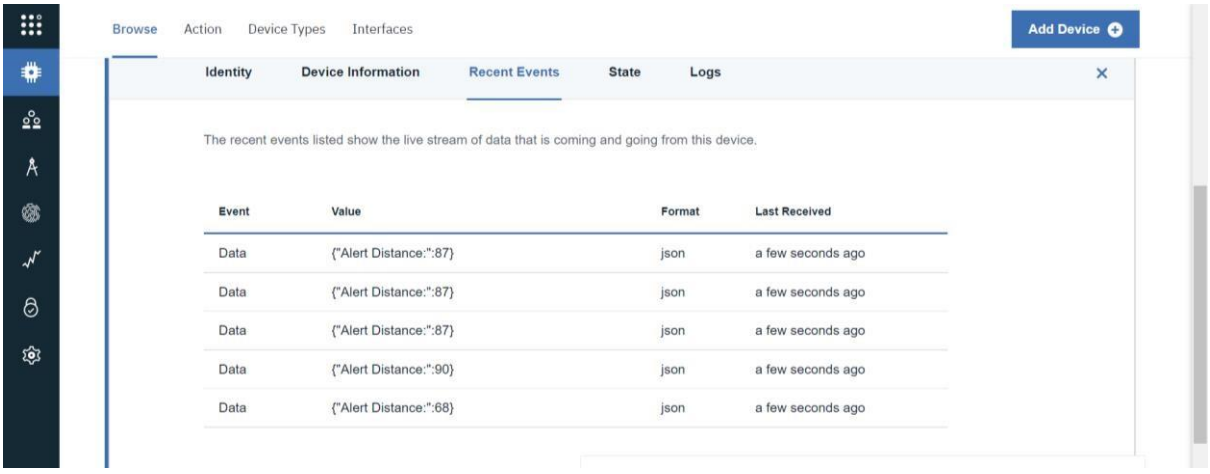
```
  } else {
    Serial.println("subscribe to cmd FAILED");
  }
}  void callback(char* subscribetopic, byte* payload, unsigned int
payloadLength)
{

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

CIRCUIT DIAGRAM:



OUTPUT:





Project Link:

https://wokwi.com/projects/346773638705316434