Data Publish to IOT Device

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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 "rdegyk"//IBM ORGANITION ID

#define DEVICE_TYPE "weather1 "//Device type mentioned in ibm watson IOT Platform

#define DEVICE_ID "weather1 "//Device ID mentioned in ibm watson IOT Platform

#define TOKEN " _oa-3bajxqvCrO(6kW "     //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[] = "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


int LED = 4;

int trig = 5;

int echo = 18;

void setup()

{

Serial.begin(115200);

pinMode(trig,OUTPUT);

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
  {
   digitalWrite(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");
  }
```

```cpp
}
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");
 }
```
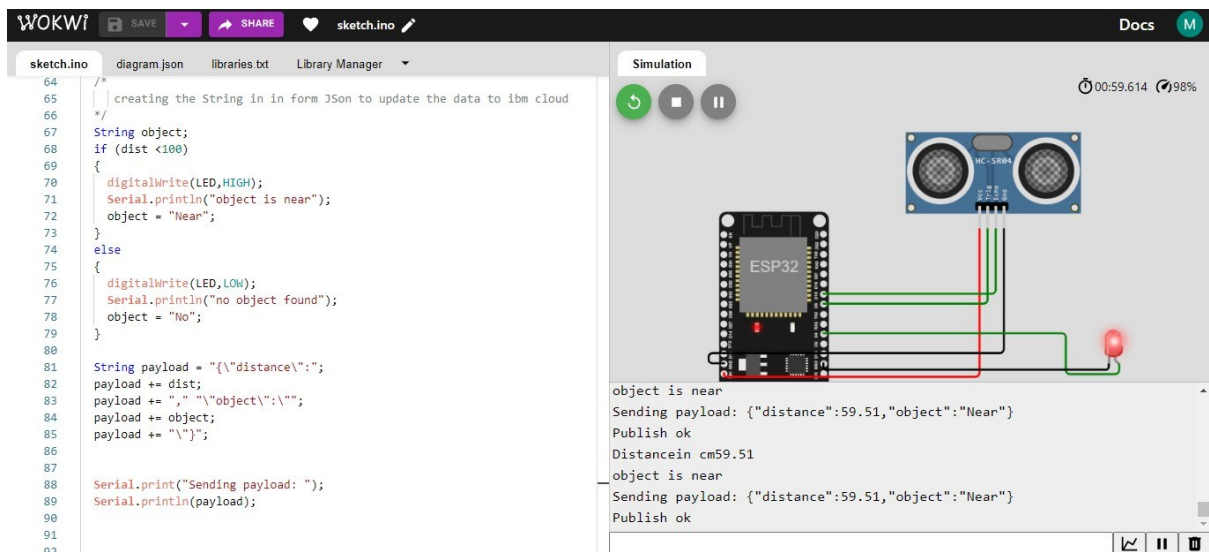
```
}

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/347311168141918803

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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

←