Assignment-4

SmartFarmer-IoTEnabledSmartFarmingApplication

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Question:

Writecodeandconnectionsinwokwifortheultrasonicsensor. Wheneverthedistance is less than 100 cms send an "alert" to the IBM cloud and display in the device recentevents. Uploaddocument with wokwish are linkandimages of IBM cloud

CODE:

```
#include<WiFi.h>//library for wifi
#include<PubSubClient.h>//library for MQtt
voidcallback(char* subscribetopic, byte* payload, unsignedintpayloadLength);
//----credentials of IBM Accounts-----
#define ORG "az10eu"//IBM ORGANITION ID
#define DEVICE_TYPE "UltraSonicSensor"//Device type mentioned in ibmwatson IOT Platform
#define DEVICE ID "1234"//Device ID mentioned in ibmwatson IOT Platform
#define TOKEN "12345678"
                            //Token
String data3;
floatdist;
//----- Customise the above values ------
charserver[] = ORG ".messaging.internetofthings.ibmcloud.com";// Server Name
charpublishTopic[] = "iot-2/evt/Data/fmt/json";// topic name and type of event perform
and format in which data to be send
charsubscribetopic[] = "iot-2/cmd/test/fmt/String";// cmd REPRESENT command type AND
COMMAND IS TEST OF FORMAT STRING
charauthMethod[] = "use-token-auth";// authentication method
chartoken[] = TOKEN;
charclientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;//client id
WiFiClientwifiClient; // creating the instance for wificlient
PubSubClientclient(server, 1883, callback ,wifiClient); //calling the predefined client
id by passing parameter like server id, portandwificredential
int LED = 4;
int trig = 5;
int echo = 18;
voidsetup()
Serial.begin(115200);
pinMode(trig,OUTPUT);
pinMode(echo, INPUT);
```

```
pinMode(LED, OUTPUT);
delay(10);
wificonnect();
mqttconnect();
voidloop()// Recursive Function
{
digitalWrite(trig,LOW);
 digitalWrite(trig,HIGH);
 delayMicroseconds(10);
 digitalWrite(trig,LOW);
 float dur = pulseIn(echo,HIGH);
 floatdist = (dur * 0.0343)/2;
 Serial.print ("Distancein cm");
 Serial.println(dist);
 PublishData(dist);
 delay(1000);
 if(!client.loop()) {
   mqttconnect();
 }
}
/*....retrieving to
Cloud....*/
voidPublishData(floatdist) {
 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)</pre>
   digitalWrite(LED,HIGH);
   Serial.println("object is near");
   object = "Alert: Person Detected";
 }
  else
   digitalWrite(LED,LOW);
   Serial.println("no object found");
   object = "No";
 }
  String payload = "{\"distance\":";
  payload += dist;
  payload += ",""\"object\":\"";
  payload += object;
  payload += "\"}";
```

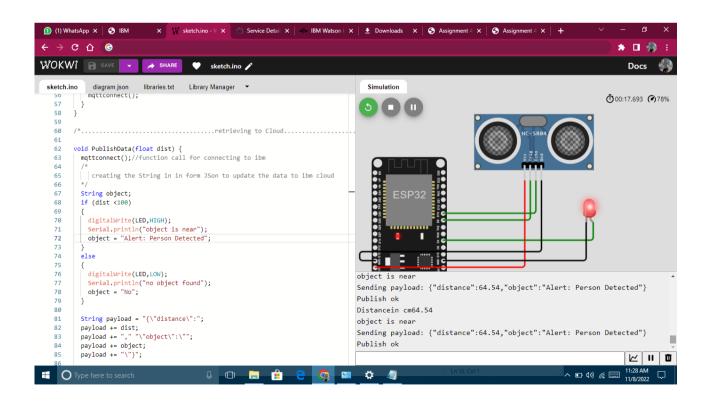
```
Serial.print("Sending payload: ");
  Serial.println(payload);
  if (client.publish(publishTopic, (char*) payload.c_str())) {
    Serial.println("Publish ok");// if it sucessfully upload data on the cloud then it
will print publish ok in Serial monitor or else it will print publish failed
 } else {
   Serial.println("Publish failed");
 }
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() //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());
}
voidinitManagedDevice() {
  if (client.subscribe(subscribetopic)) {
   Serial.println((subscribetopic));
   Serial.println("subscribe to cmd OK");
 } else {
   Serial.println("subscribe to cmd FAILED");
 }
}
voidcallback(char* subscribetopic, byte* payload, unsignedintpayloadLength)
```

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

WokwiLink:

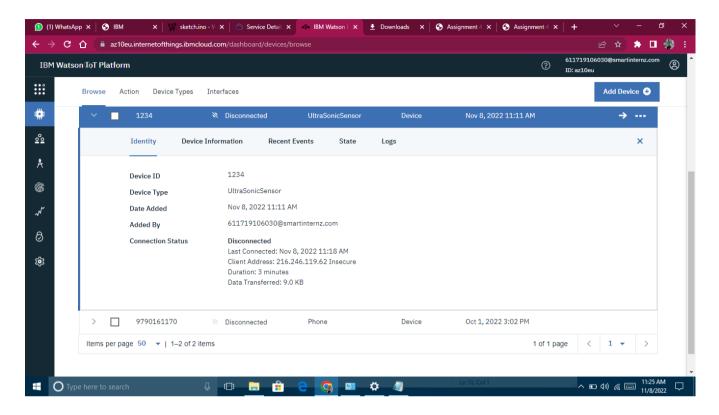
https://wokwi.com/projects/347204840687927891

OutputandSimulation:



IBM cloud:

Device Information:



DeviceRecentEvents:

Whenever the distance is less than 100 cmss end an ''alert'' to the IBM cloud and display in the device recent events.

