ASSIGNMENT 4

PYTHON PROGRAMMING

ASSIGNMENT DATE	17 OCTOBER 2022
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MAXIMUM MARKS	2

Question:

Write code and connections in wowki for ultrasonic

sensor. Whenever distance is less than 100cms send

"alert" to IBM cloud and display in device recent events.

Program Code:

#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 "n6rl9n"//IBM Organition ID

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

Platform

#define DEVICE_ID "06112002"//Device ID mentioned in ibm watson IOT Platform

#define TOKEN "98765432" //Token

String data3;

// 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
const int trigpin = 5;
const int echopin = 18;
const int ledpin = 2;
long duration;
float distance;
#define sound_speed 0.034
void setup()
Serial.begin(115200);
pinMode(trigpin, OUTPUT);
pinMode(echopin, OUTPUT);
pinMode(ledpin, OUTPUT);
wificonnect();
mqttconnect();
}
void loop()
{
```

```
digitalWrite(trigpin, LOW);
digitalWrite(trigpin, HIGH);
delayMicroseconds(10);
digitalWrite(trigpin, LOW);
duration= pulseIn(echopin,HIGH);
distance = duration * sound_speed /2;
if(distance<=100)
{
PublishData(distance);
delay(1000);
if (!client.loop())
mqttconnect();
}
digitalWrite(ledpin, HIGH);
Serial.println("Alert !!");
Serial.println(distance);
}
else
{
digitalWrite(ledpin, LOW);
}
delay(10); // this speeds up the simulation
}
// Retrieving to Cloud
```

```
void PublishData(float distance)
{
mqttconnect();// Function call for connecting to ibm
// creating the String in in form JSon to update the data to ibm cloud
String payload = "{\"Alert !! \": ";
payload += distance;
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++)</pre>
{
//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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