**Assignment -4**

**IOT Based smart crop protection system**

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| Assignment Date | 6 November 2022 |
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| Maximum Marks | 2 Marks |

**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 "za7x6f"//IBM ORGANITION ID

#define DEVICE\_TYPE "rj46 "//Device type mentioned in ibm watson IOT Platform

#define DEVICE\_ID "raj46 "//Device ID mentioned in ibm watson IOT Platform

#define TOKEN "R0Q4uhcOcCD0hnom)K" //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");

}

}

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/347322163482591827

