

ASSINGMENT -4

Assignment Date	30 October 2022
Team ID	PNT2022TMID38557
Project Name	IOT Based Smart Crop Protection System for Agriculture
Maximum Marks	2 Marks

Question :

Write a code and connections in wokwi for the ultrasonic sensor. Whenever the distance is less than 100cms send an “Alert” to IBM cloud and display in the device recent events.

Code:

```
#include <WiFi.h>
#include <PubSubClient.h> void callback(char* subscribetopic, byte* payload, unsigned
int payloadLength);
//-----credentials of IBM Accounts-----
#define ORG "kotoq5"//IBM ORGANITION ID
#define DEVICE_TYPE "ESP32"//Device type mentioned in ibm watson IOT Platform
#define DEVICE_ID "12345"//Device ID mentioned in ibm watson IOT Platform
#define TOKEN "12345678" //Token String data3; char server[] = ORG
".messaging.internetofthings.ibmcloud.com"; char publishTopic[] = "iot-
2/evt/Data/fmt/json"; char subscribetopic[] = "iot-2/cmd/test/fmt/String"; char
authMethod[] = "use-token-auth";
char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
WiFiClient wifiClient;
```

```

PubSubClient client(server, 1883, callback ,wifiClient); const int trigPin = 5;
const int echoPin = 18; #define SOUND_SPEED 0.034 long duration; float distance;
void setup() { Serial.begin(115200); pinMode(trigPin, OUTPUT); pinMode(echoPin,
INPUT); wificonnect(); mqttconnect(); } void loop() { digitalWrite(trigPin,
LOW); delayMicroseconds(2); digitalWrite(trigPin, HIGH); delayMicroseconds(10);
digitalWrite(trigPin, LOW); duration = pulseIn(echoPin, HIGH); distance =
duration *
SOUND_SPEED/2;
Serial.print("Distance (cm): "); Serial.println(distance);
if(distance<100)
{
Serial.println("ALERT!!"); delay(1000); PublishData(distance) ;
delay(1000); if (!client.loop()) { mqttconnect();
} } delay(1000); } void PublishData(float dist) {
mqttconnect();
String payload = "{\"Distance\": "; payload += dist; payload +=
",\"ALERT!!\": \"\"Distance less than 100cms\"\""; payload += "}";
Serial.print("Sending payload: ");
Serial.println(payload);

if (client.publish(publishTopic, (char*) payload.c_str())) {
Serial.println("Publish ok");
} 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();

```

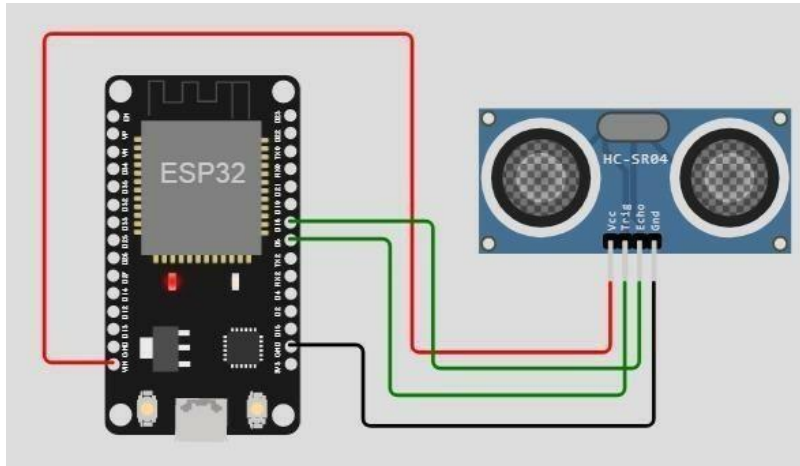
```

Serial.println();
} }
void wificonnect()
{
Serial.println(); Serial.print("Connecting to ");
WiFi.begin("Wokwi-GUEST", "", 6); 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];
}
}

```

```
Serial.println("data: "+ data3); data3="";  
}
```

Circuit Diagram:



Output:

Wokwi output:

```
Connecting to ....  
WiFi connected  
IP address:  
10.10.0.2  
Reconnecting client to ytluse.messaging.internetofthings.ibmcloud.com  
iot-2/cmd/test/fmt/String  
subscribe to cmd OK  
  
Distance (cm): 399.92  
Distance (cm): 399.96  
Distance (cm): 399.94  
Distance (cm): 399.98  
Distance (cm): 399.94  
Distance (cm): 399.92  
Distance (cm): 399.94
```

IBM cloud output:

Browse Action Device Types Interfaces

Add Device

Identity **Device Information** Recent Events State Logs

The recent events listed show the live stream of data that is coming and going from this device.

Event	Value	Format	Last Received
event_1	{"distance":7,"Alert":"Distance less than 10"}	json	a few seconds ago
event_1	{"distance":9,"Alert":"Distance less than 10"}	json	a few seconds ago
event_1	{"distance":8,"Alert":"Distance less than 10"}	json	a few seconds ago
event_1	{"distance":9,"Alert":"Distance less than 10"}	json	a few seconds ago