Assignment -4
Python Programming
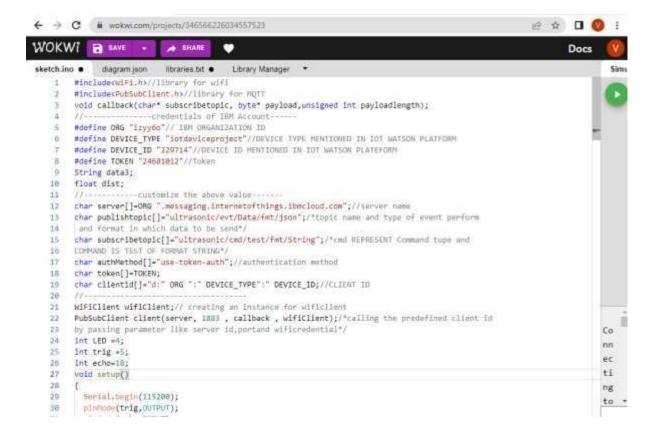
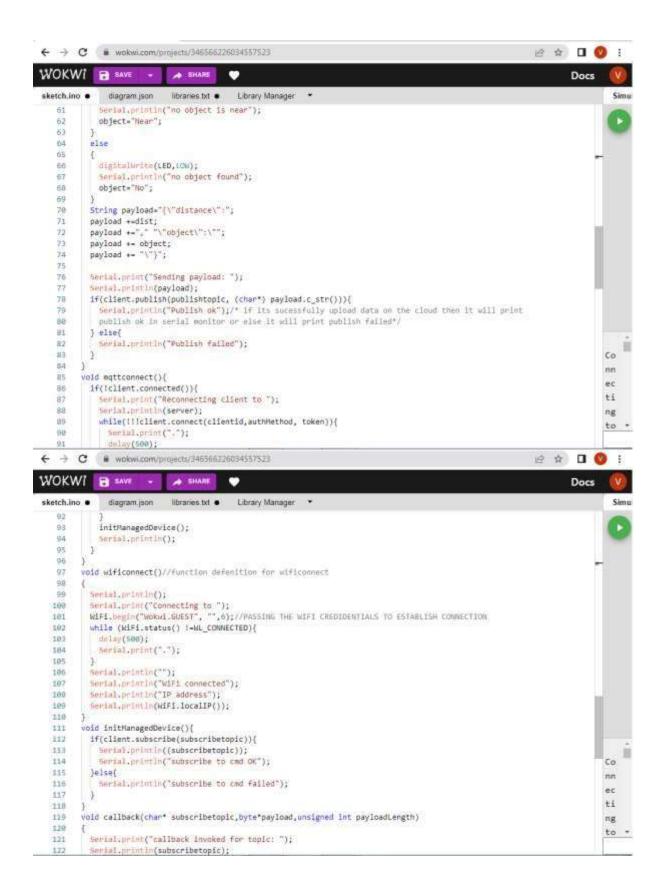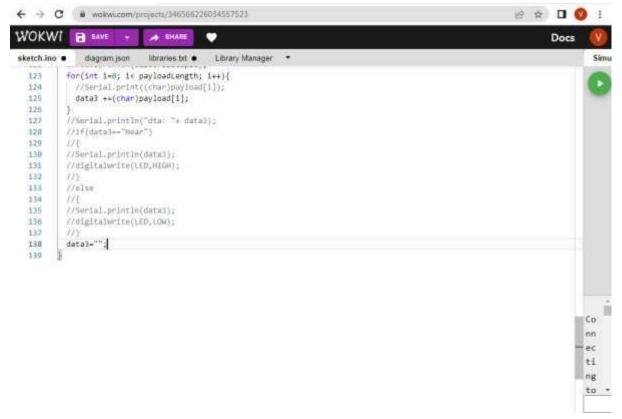| Assignment Date	30 October2022
Student Name	Pavithra K
Student Reg Number	710719106063
Maximum marks	2 Marks

Question-1:

Write code and connections in wokwi for ultrasonic sensor.
Whenever distance is less than 100 cms send "alert" to ibm cloud and display in device recent events.
Upload document with wokwi share link and images of ibm cloud.

Solution:

```
 1  #include<WiFi.h>//library for wifi
 2  #include<PubSubClient.h>//library for MQTT
 3  void callback(char* subscribetopic, byte* payload,unsigned int payloadlength);
 4  //----------------credentials of IBM Account------
 5  #define ORG "izyy6o"// IBM ORGANIZATION ID
 6  #define DEVICE_TYPE "iotdeviceproject"//DEVICE TYPE MENTIONED IN IOT WATSON PLATFORM
 7  #define DEVICE_ID "229714"//DEVICE ID MENTIONED IN IOT WATSON PLATEFORM
 8  #define TOKEN "24681012"//Token
 9  String data3;
10  float dist;
11  //-------------customize the above value-------
12  char server[]=ORG ".messaging.internetofthings.ibmcloud.com";//server name
13  char publishtopic[]="ultrasonic/evt/Data/fmt/json";/*topic name and type of event perform
14   and format in which data to be send*/
15  char subscribetopic[]="ultrasonic/cmd/test/fmt/String";/*cmd REPRESENT Command tupe and
16  COMMAND IS TEST OF FORMAT STRING*/
17  char authMethod[]="use-token-auth";//authentication method
18  char token[]=TOKEN;
19  char clientId[]="d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;//CLIENT ID
20  //-----------------------------------
21  WiFiClient wifiClient;// creating an Instance for wifiClient
22  PubSubClient client(server, 1883 , callback , wifiClient);/*calling the predefined client id
23  by passing parameter like server id,portand wificredential*/
24  int LED =4;
25  int trig =5;
26  int echo=18;
27  void setup()
28  {
29    Serial.begin(115200);
30    pinMode(trig,OUTPUT);
```

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```
61      Serial.println("no object is near");
62      object="Near";
63    }
64    else
65    {
66      digitalWrite(LED,LOW);
67      Serial.println("no object found");
68      object="No";
69    }
70    String payload="{\"distance\":";
71    payload +=dist;
72    payload +="," "\"object\":\"";
73    payload += object;
74    payload += "\"}";
75
76    Serial.print("Sending payload: ");
77    Serial.println(payload);
78    if(client.publish(publishtopic, (char*) payload.c_str())){
79      Serial.println("Publish ok");/* If its sucessfully upload data on the cloud then it will print
80      publish ok in serial monitor or else it will print publish failed*/
81    } else{
82      Serial.println("Publish failed");
83    }
84  }
85  void mqttconnect(){
86    if(!client.connected()){
87      Serial.print("Reconnecting client to ");
88      Serial.println(server);
89      while(!!!client.connect(clientId,authMethod, token)){
90        Serial.print(".");
91        delay(500);
```

```
92      }
93      initManagedDevice();
94      Serial.println();
95    }
96  }
97  void wificonnect()//function defenition for wificonnect
98  {
99    Serial.println();
100   Serial.print("Connecting to ");
101   WIFI.begin("Wokwi.GUEST", "",6);//PASSING THE WIFI CREDIDENTIALS TO ESTABLISH CONNECTION
102   while (WiFi.status() !=WL_CONNECTED){
103     delay(500);
104     Serial.print(".");
105   }
106   Serial.println("");
107   Serial.println("WiFi connected");
108   Serial.println("IP address");
109   Serial.println(WIFI.localIP());
110 }
111 void initManagedDevice(){
112   if(client.subscribe(subscribetopic)){
113     Serial.println((subscribetopic));
114     Serial.println("subscribe to cmd OK");
115   }else{
116     Serial.println("subscribe to cmd failed");
117   }
118 }
119 void callback(char* subscribetopic,byte*payload,unsigned int payloadLength)
120 {
121   Serial.print("callback invoked for topic: ");
122   Serial.println(subscribetopic);
```

```
123    for(int i=0; i< payloadLength; i++){
124      //Serial.print((char)payload[i]);
125      data3 +=(char)payload[i];
126    }
127    //Serial.println("dta: "+ data3);
128    //if(data3=="Near")
129    //{
130    //Serial.println(data3);
131    //digitalwrite(LED,HIGH);
132    //}
133    //else
134    //{
135    //Serial.println(data3);
136    //digitalwrite(LED,LOW);
137    //}
138    data3="";
139  }
```

OUTPUT:
DATA IS SENT TO IBM CLOUD WHEN NO OBJECT IS DETECTED

When no object is detected

When object is detected in ultrasonic detector