IBM ASSIGNMENT - 4

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Project Title	Child Safety Monitoring and Notification

QUESTION :

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.

CODE :

```
#include <WiFi.h> // library for wifi

#include <PubSubClient.h>           // library for MQTT
 //------- credentials of IBM
Accounts ---------
#define ORG "rwazv5" // IBM organisation id
  #define DEVICE_TYPE "NodeRed" // Device type mentioned in ibm
  watson iot platform #define DEVICE_ID "12345"        // Device ID
  mentioned in ibm
watson iot platform #define TOKEN "vC@S3TBre6(97jAOJ_" // Token
#define      speed
  0.034 #define led
  14 String data3;
  int LED =
4;
// ..... customise above values ..... -

   char server[] = ORG ".messaging.internetofthings.ibmcloud.com"; // server
   name char publishTopic[] = "iot-2/evt/sreedhar/fmt/json";       // topic name
   and type of event perform
  and format in which data to be send
char topic[] = "iot-2/cmd/led/fmt/String"; // cmd Represent type and command is test
```

```
  format of strings
char authMethod[] = "use-token-auth"; // authentication method
  char token[] = TOKEN;
  char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID; //Client id

// ----------------------------------------------------------------------------

WiFiClient wifiClient; // creating instance for wificlient
  PubSubClient client(server, 1883, wifiClient); // calling the predefined client id by
  passing parameter like server id,port and wifi credential


  const int trigpin=5;
  const int
  echopin=18; String
  command;
  String data="";


  long duration;
  float dist;

  void setup()
  {
  Serial.begin(115200);
  pinMode(led, OUTPUT);
  pinMode(trigpin,
  OUTPUT);
  pinMode(echopin,
  INPUT); wifiConnect();
  mqttConnect();
  }


  void loop() { bool isNearby
  =    dist    <
```

```
      100;
  digitalWrite(led,
  isNearby);

  publishData(
  ); delay(500);

  if (!client.loop())
  {
mqttConnect();   // function call to connect to ibm
  }
  }

/*_____retrieving to cloud_____*/

  void wifiConnect()
  {
  Serial.print("Connecting to ");
  Serial.print("Wifi");
  WiFi.begin("Wokwi-GUEST", "",
  6);
  while (WiFi.status() != WL_CONNECTED)
  {
  delay(500);
  Serial.print(".");
  }
  Serial.print("WiFi connected, IP address: ");
  Serial.println(WiFi.localIP());
  }

  void mqttConnect()
  {
  if (!client.connected())
```

```
{
Serial.print("Reconnecting MQTT client
to "); Serial.println(server); while
(!client.connect(clientId, authMethod,
token))
{
Serial.print("."
); delay(500);
}
initManagedDevice();
Serial.println();
}
}

voi
d
initManagedDevice() { if
(client.subscribe(topic))
{
Serial.println("IBM subscribe to cmd OK");
}
else
{
Serial.println("subscribe to cmd FAILED");
}
}
void publishData()
{
digitalWrite(trigpin,LOW
);
digitalWrite(trigpin,HIGH
);
delayMicroseconds(10);
digitalWrite(trigpin,LOW);
duration=pulseIn(echopin,HIGH);
dist=duration*speed/2;
if(dist<100)
```

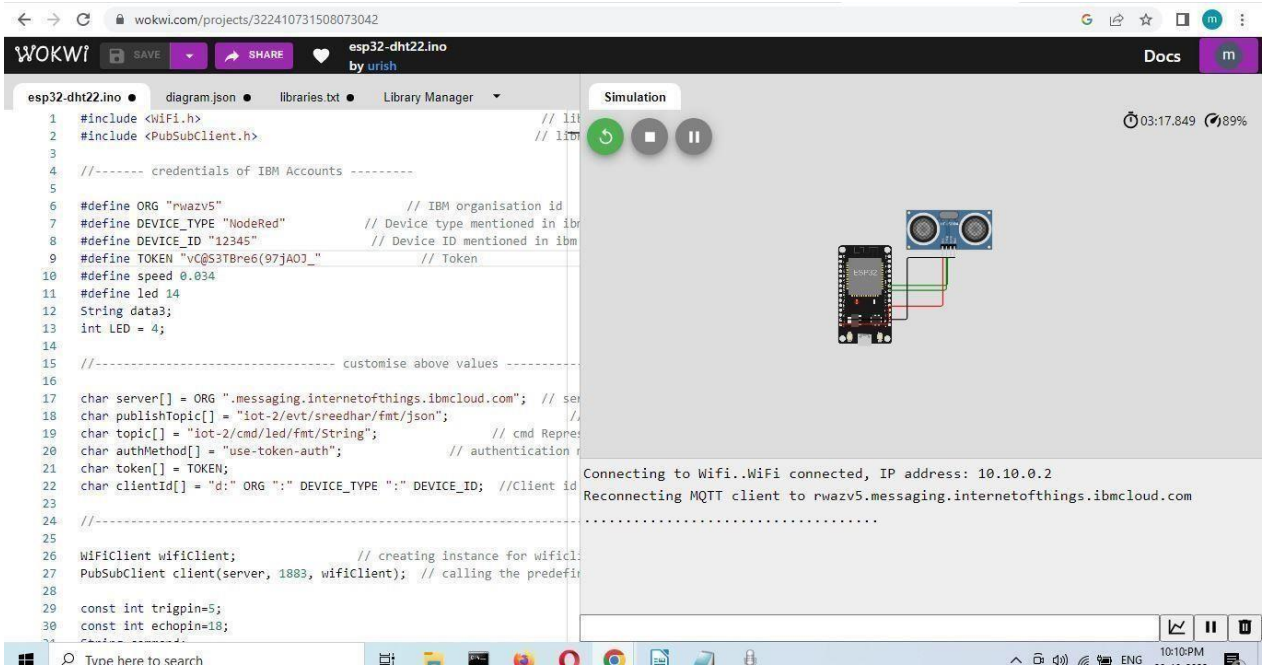
```
{
digitalWrite(LED,HIGH);
String payload = "{\"Alert
Distance\":"; payload += dist;
payload += "}";
Serial.print("\n");
Serial.print("Sending payload: "); Serial.println(payload); if
(client.publish(publishTopic, (char*) payload.c_str())) // if data is uploaded to
cloud successfully,prints publish ok else prints publish failed
{
Serial.println("Publish OK");
}

}
if(dist>100)
{
digitalWrite(LED,HIGH);
String payload =
"{\"Distance\":"; payload +=
dist;
payload += "}";

Serial.print("\n");
Serial.print("Sending payload:
"); Serial.println(payload);
if(client.publish(publishTopic, (char*)
payload.c_str()))
{
Serial.println("Publish OK");
}
else
{
digitalWrite(LED,LOW);
Serial.println("Publish FAILED");
}
```

}

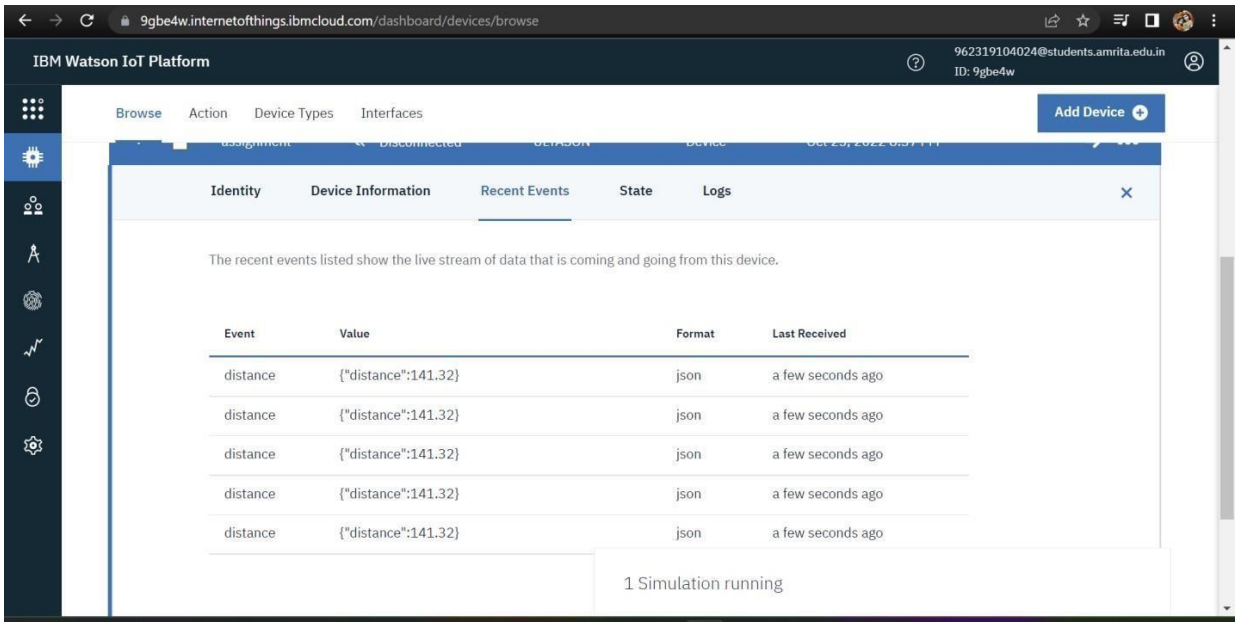
}

OUTPUT :

Code simulation on wokwi



Data sent to IBM Cloud with distance


9gbe4w.internetofthings.ibmcloud.com/dashboard/devices/browse
IBM Watson IoT Platform
962319104024@students.amrita.edu.in
ID: 9gbe4w
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
distance
{"distance":141.32}
json
a few seconds ago
distance
{"distance":141.32}
json
a few seconds ago
distance
{"distance":141.32}
json
a few seconds ago
distance
{"distance":141.32}
json
a few seconds ago
distance
{"distance":141.32}
json
a few seconds ago
1 Simulation running