

#### Assignment -4

Assignment Date	25 October 2022
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Student Roll Number	813819106025
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.

```
//Pins
const int TRIG_PIN = 7;
const int ECHO_PIN = 8;

//Anything over 400cm (23200 us pulse) is "out of range"
const unsigned int MAX_DIST = 23200;

void setup() {

  //The trigger pin will tell the sensor to range find
  pinMode(TRIG_PIN, OUTPUT);
  digitalWrite(TRIG_PIN, LOW);

  //Set Echo pin as input to measure the duration of
  //pulses coming back from the distance sensor
  pinMode(ECHO_PIN, INPUT);

  //We'll use the serial monitor to view the sensor output
  Serial.begin(9600);
}

void loop() {

  unsigned long t1;
  unsigned long t2;
  unsigned long pulse_width;
  float cm;
  float inches;

  //Hold the trigger pin high for at least 10us
  digitalWrite(TRIG_PIN, HIGH);
```

```

delayMicroseconds(10);
digitalWrite(TRIG_PIN,LOW);

//Waitforpulseonechopin
while(digitalRead(ECHO_PIN)==0);

//Measurehowlongtheechopinwasheldhigh(pulsewidth)
//Note:the micros()counterwilloverflowafter~70min t1
= micros();
while(digitalRead(ECHO_PIN)==1);
t2 = micros();
pulse_width=t2-t1;

//Calculatedistanceincentimetersandinches.Theconstants
//arefoundinthedatasheet,andcalculatedfromtheassumedspeed
//ofsoundinairatsealevel(~340m/s). cm
= pulse_width / 58.0;
inches=pulse_width/148.0;

//Printoutresults
if(pulse_width>MAX_DIST){
  Serial.println("Out of range");
} else {
  Serial.println("*****");S
  erial.print("The Measured Distance in cm : ");
  Serial.println(cm);

  if(cm<100){
    // while(true){
    Serial.println("Alert!!");
    //}
  }

  Serial.print("*****");
}

//Waitatleast1000msbeforenextmeasurement
delay(1000);
}

```

## WOKWI SIMULATION:

### Case 1: Distance less than 100 cm

WOKWI

SAVE SHARE

hc-sr04.ino diagram.json Library Manager

```
1 // Pins
2 const int TRIG_PIN = 7;
3 const int ECHO_PIN = 8;
4
5 // Anything over 400 cm (23200 us pulse) is "out of range"
6 const unsigned int MAX_DIST = 23200;
7
8 void setup() {
9
10 // The Trigger pin will tell the sensor to range find
11 pinMode(TRIG_PIN, OUTPUT);
12 digitalWrite(TRIG_PIN, LOW);
13
14 //Set Echo pin as input to measure the duration of
15 //pulses coming back from the distance sensor
16 pinMode(ECHO_PIN, INPUT);
17
18 // We'll use the serial monitor to view the sensor output
19 Serial.begin(9600);
20
21
22 void loop() {
23
24 unsigned long t1;
25 unsigned long t2;
26 unsigned long pulse_width;
27 float cm;
28 float inches;
```

Simulation

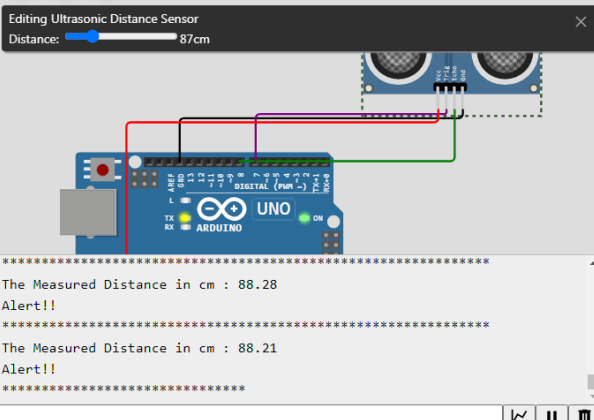
02:11.864 64%

Editing Ultrasonic Distance Sensor

Distance: 87cm

The Measured Distance in cm : 88.28  
Alert!!

The Measured Distance in cm : 88.21  
Alert!!



### Case 2: Distance greater than 100 cms

WOKWI

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hc-sr04.ino diagram.json Library Manager

```
1 {
2   "version": 1,
3   "author": "Uri Shaked",
4   "editor": "wokwi",
5   "parts": [
6     { "type": "wokwi-arduino-uno", "id": "uno", "top": 130.93, "left": 2.53, "
7       {
8         "type": "wokwi-hc-sr04",
9         "id": "ultrasonic",
10        "top": -4.1,
11        "left": 296.43,
12        "attrs": { "distance": "66" }
13      }
14    ],
15    "connections": [
16      [ "uno:GND.1", "ultrasonic:GND", "black", [ "v-8", "*", "v8" ] ],
17      [ "uno:8", "ultrasonic:ECHO", "green", [ ] ],
18      [ "uno:7", "ultrasonic:TRIG", "purple", [ "*", "v4" ] ],
19      [ "uno:5V", "ultrasonic:VCC", "red", [ "v16", "h-96", "*", "v12" ] ]
20    ]
21  }
```

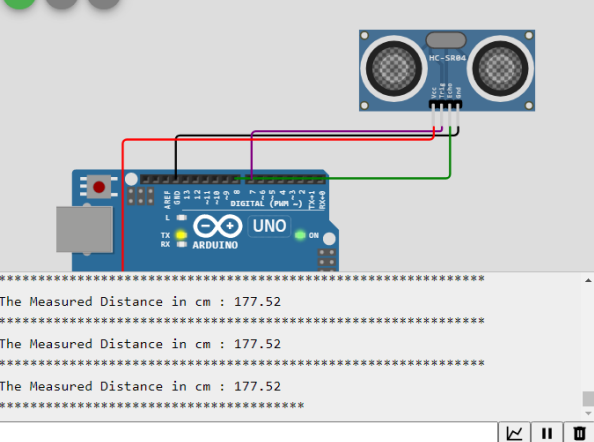
Simulation

03:24.230 87%

The Measured Distance in cm : 177.52

The Measured Distance in cm : 177.52

The Measured Distance in cm : 177.52



## WOKWI LINK:

<https://wokwi.com/projects/346845722909344339>

## IBM CLOUD:

IBM Watson IoT Platform

jenimonisha2002@gmail.com  
ID: 7956ul

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	{"randomNumber":64}	json	a few seconds ago
event_1	{"distance":91,"status":"alert"}	json	a few seconds ago
event_1	{"distance":9,"status":"alert"}	json	a few seconds ago
event_1	{"distance":64,"status":"alert"}	json	a few seconds ago
event_1	{"distance":15,"status":"alert"}	json	a few seconds ago

1 Simulation running