

**ASSIGNMENT-4**

**DISTANCE DETECTION USING ULTRASONIC SENSOR**

<b>Date</b>	03.11.2022
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**Question1 :**

Write code and connections in wokwi for ultrasonic sensors. Whenever distance is less than 220 cms send "alert" to ibm cloud and display in device recent events

In my project wokwi link: <https://wokwi.com/projects/290056311044833800>

**CODE:**



```
1  /*
2   HC-SR04 Ultrasonic Sensor Example.
3
4   Turn the LED on when an object is within 100cm range.
5
6   Copyright (C) 2021, Uri Shaked
7  */
8
9  #define ECHO_PIN 2
10 #define TRIG_PIN 3
11
12 void setup() {
13   Serial.begin(115200);
14   pinMode(LED_BUILTIN, OUTPUT);
15   pinMode(TRIG_PIN, OUTPUT);
16   pinMode(ECHO_PIN, INPUT);
17 }
18
19 float readDistanceCM() {
20   digitalWrite(TRIG_PIN, LOW);
21   delayMicroseconds(2);
22   digitalWrite(TRIG_PIN, HIGH);
23   delayMicroseconds(10);
24   digitalWrite(TRIG_PIN, LOW);
25   int duration = pulseIn(ECHO_PIN, HIGH);
26   return duration * 0.034 / 2;
27 }
28
29 void loop() {
30   float distance = readDistanceCM();
31 }
```



hc-sr04.ino

diagram.json

Library Manager



```
1  {
2    "version": 1,
3    "author": "Uri Shaked",
4    "editor": "wokwi",
5    "parts": [
6      {
7        "type": "wokwi-arduino-uno",
8        "id": "uno",
9        "top": 275.99,
10       "left": 47.73,
11       "rotate": 0,
12       "hide": false,
13       "attrs": {}
14     },
15     {
16       "type": "wokwi-resistor",
17       "id": "r1",
18       "top": 165.87,
19       "left": 142.81,
20       "rotate": 90,
21       "hide": false,
22       "attrs": { "value": "220" }
23     },
24     {
25       "type": "wokwi-led",
26       "id": "led",
27       "top": 87.29,
28       "left": 147.05,
29       "rotate": 0,
30       "hide": false,
31       "attrs": { "color": "red" }
```



hc-sr04.ino

diagram.json

Library Manager



```
23 },
24 {
25   "type": "wokwi-led",
26   "id": "led",
27   "top": 87.29,
28   "left": 147.05,
29   "rotate": 0,
30   "hide": false,
31   "attrs": { "color": "red" }
32 },
33 {
34   "type": "wokwi-hc-sr04",
35   "id": "ultrasonic",
36   "top": 108.43,
37   "left": 196.5,
38   "rotate": 0,
39   "hide": false,
40   "attrs": { "distance": "180" }
41 }
42 ],
43 "connections": [
44   [ "uno:GND.1", "ultrasonic:GND", "black", [ "v-8", "*", "v8" ] ],
45   [ "uno:2", "ultrasonic:ECHO", "green", [ ] ],
46   [ "uno:3", "ultrasonic:TRIG", "purple", [ "*", "v4" ] ],
47   [ "uno:5V", "ultrasonic:VCC", "red", [ "v16", "h-96", "*", "v12" ] ],
48   [ "uno:GND.1", "led:C", "black", [ ] ],
49   [ "r1:1", "led:A", "blue", [ ] ],
50   [ "uno:13", "r1:2", "blue", [ ] ]
51 ]
52 }
```

hc-sr04.ino

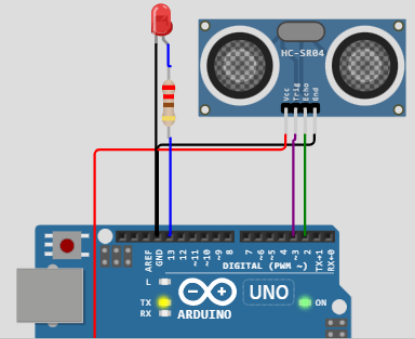
diagram.json

Library Manager

Simulation

00:03.633

```
1 {
2   "version": 1,
3   "author": "Uri Shaked",
4   "editor": "wokwi",
5   "parts": [
6     {
7       "type": "wokwi-arduino-uno",
8       "id": "uno",
9       "top": 275.99,
10      "left": 47.73,
11      "rotate": 0,
12      "hide": false,
13      "attrs": {}
14    },
15    {
16      "type": "wokwi-resistor",
17      "id": "r1",
18      "top": 165.87,
19      "left": 142.81,
20      "rotate": 90,
21      "hide": false,
22      "attrs": { "value": "220" }
23    },
24    {
25      "type": "wokwi-led",
26      "id": "led",
27      "top": 87.29,
28      "left": 147.05,
29      "rotate": 0,
30      "hide": false,
```



Measured distance: 177.26  
Measured distance: 177.16  
Measured distance: 177.26  
Measured distance: 177.24  
Measured distance: 177.26  
Measured distance: 177.24  
Measured distance: 177.26