

## Assignment -4

### WOKWI SIMULATION

Assignment Date	23 October 2022
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Maximum Marks	2 Marks

#### Question-1:

**Write code and connections in wokwi for the ultrasonic sensor.  
Whenever the distance is less than 100cms send an alert to the ibm  
cloud anddisplay in the device recent events.**

#### Code:

LINK: <https://wokwi.com/projects/346141727303664212>

```
#define ECHO_PIN 2
#define TRIG_PIN 3

void setup() {
  Serial.begin(115200);
  pinMode(LED_BUILTIN, OUTPUT);
  pinMode(TRIG_PIN, OUTPUT);
  pinMode(ECHO_PIN, INPUT);
}

float readDistanceCM() {
  digitalWrite(TRIG_PIN, LOW);
  delayMicroseconds(2);
  digitalWrite(TRIG_PIN, HIGH);
  delayMicroseconds(10);
  digitalWrite(TRIG_PIN, LOW);
  int duration = pulseIn(ECHO_PIN, HIGH);
  return duration * 0.034 / 2;
}

void loop() {
  float distance = readDistanceCM();

  bool isNearby = distance < 100;
```

```

digitalWrite(LED_BUILTIN, isNearby);

Serial.print("Measured distance: ");
Serial.println(readDistanceCM());

delay(100);
}

```

## DIAGRAM.JSON:

```
{
  "version": 1,
  "author": "sindhuja",
  "editor": "wokwi",
  "parts": [
    {
      "type": "wokwi-arduino-uno",
      "id": "uno",
      "top": 275.99,
      "left": 47.73,
      "rotate": 0,
      "hide": false,
      "attrs": {}
    },
    {
      "type": "wokwi-resistor",
      "id": "r1",
      "top": 165.87,
      "left": 142.81,
      "rotate": 90,
      "hide": false,
      "attrs": { "value": "220" }
    },
    {
      "type": "wokwi-led",
      "id": "led",
      "top": 87.29,
      "left": 147.05,
      "rotate": 0,
      "hide": false,
      "attrs": { "color": "blue" }
    },
    {
      "type": "wokwi-hc-sr04",
      "id": "ultrasonic",
      "top": 10.0,
      "left": 147.05,
      "rotate": 0,
      "hide": false,
      "attrs": {}
    }
  ]
}
```

```

        "top": 108.43,
        "left": 196.5,
        "rotate": 0,
        "hide": false,
        "attrs": { "distance": "180" }
    }
],
"connections": [
    [ "uno:GND.1", "ultrasonic:GND", "black", [ "v-8", "*", "v8" ] ],
    [ "uno:2", "ultrasonic:ECHO", "green", [ ] ],
    [ "uno:3", "ultrasonic:TRIG", "purple", [ "*", "v4" ] ],
    [ "uno:5V", "ultrasonic:VCC", "blue", [ "v16", "h-96", "*", "v12" ] ],
    [ "uno:GND.1", "led:C", "black", [ ] ],
    [ "r1:1", "led:A", "red", [ ] ],
    [ "uno:13", "r1:2", "red", [ ] ]
]
}

```

## OUTPUT:

The screenshot shows the Wokwi web-based development environment. On the left, the Arduino IDE interface displays the code for an HC-SR04 ultrasonic sensor. The code initializes pins 2 and 3, sets up the serial port at 115200 bps, and defines a function to read distance in centimeters by timing the pulse from pin 2 to the echo on pin 3. It also includes a loop that prints the measured distance to the serial monitor every 100ms.

```

1
2
3 #define ECHO_PIN 2
4 #define TRIG_PIN 3
5
6 void setup() {
7     Serial.begin(115200);
8     pinMode(LED_BUILTIN, OUTPUT);
9     pinMode(TRIG_PIN, OUTPUT);
10    pinMode(ECHO_PIN, INPUT);
11 }
12
13 float readDistanceCM() {
14     digitalWrite(TRIG_PIN, LOW);
15     delayMicroseconds(2);
16     digitalWrite(TRIG_PIN, HIGH);
17     delayMicroseconds(10);
18     digitalWrite(TRIG_PIN, LOW);
19     int duration = pulseIn(ECHO_PIN, HIGH);
20     return duration * 0.034 / 2;
21 }
22
23 void loop() {
24     float distance = readDistanceCM();
25
26     bool isNearby = distance < 100;
27     digitalWrite(LED_BUILTIN, isNearby);
28
29     Serial.print("Measured distance: ");
30     Serial.println(readDistanceCM());
31
32     delay(100);
33 }
34

```

The right side of the interface shows a 3D simulation of the hardware setup. An Arduino Uno board is connected to a HC-SR04 ultrasonic distance sensor. The sensor's trig pin (pin 2) is connected to digital pin 3 of the Arduino. Its echo pin (pin 3) is connected to digital pin 2 of the Arduino. A red LED is connected between digital pin 13 and ground. The Arduino is connected to a power source via its 5V and GND pins. The simulation provides a visual representation of how the components are interconnected.

