

## ASSIGNMRNT 4

Date	31October2022
TeamID	PNT2022TMID40997
MaximumMarks	2Marks

### Question1:

\*Write code and connections in wokwi for the ultrasonic sensor.

\*Write code and connections in work for ultrasonic sensor. Whenever distance is less than 100cms send "alert" to ibm cloud and display in device recent events.

### Code:

```
#define ECHO_PIN 1
#define TRIG_PIN 9

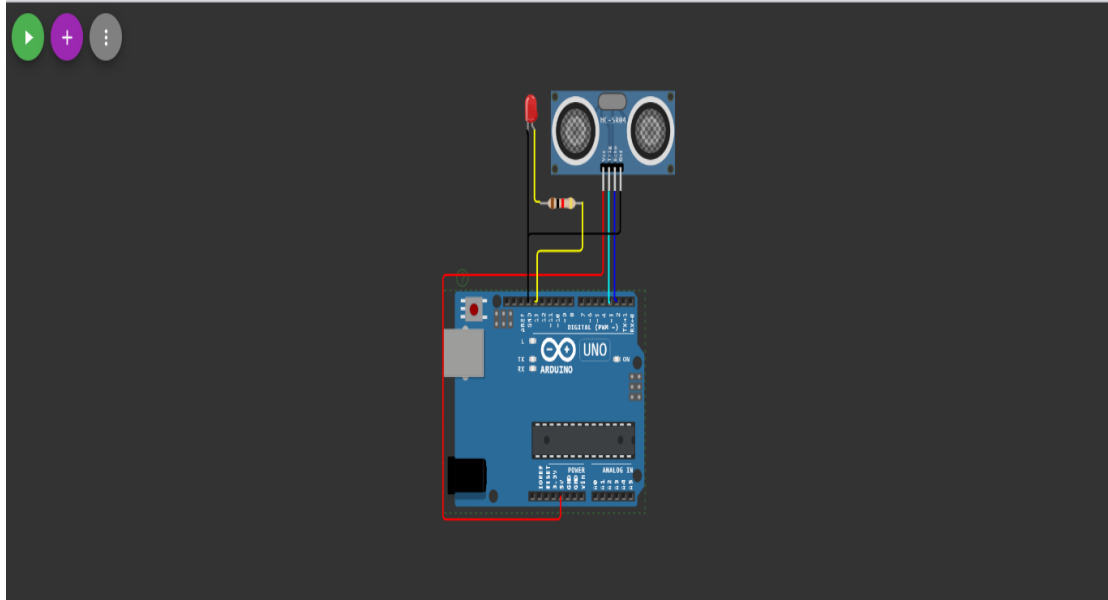
void setup() {
  Serial.begin(115200);
  pinMode(LED_BUILTIN, OUTPUT);
  pinMode(TRIG_PIN, OUTPUT);
  pinMode(ECHO_PIN, INPUT);
}

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 * 5.044/2;
}

void loop() {
  float distance = readDistanceCM();
  bool isNearby = distance < 100;
  digitalWrite(LED_BUILTIN, isNearby);
  Serial.print("Measured distance: ");
  Serial.println(readDistanceCM());
  delay(100);
}
```

WOKWI LINK : <https://wokwi.com/projects/347102827413242450>

## Solution :



WOKWI SAVE SHARE Docs

sketch.ino **diagram.json** Library Manager

Simulation

```
1
2  "1": 1,
3  "": "Anonymous maker",
4  "": "wokwi",
5  "": [
6    "wokwi-arduino-uno", "id": "uno", "top": 113.34, "left": 53
7    "wokwi-hc-sr04", "id": "ultrasonic1", "top": -75.04, "left"
8
9    "wokwi-led",
10   "": "led1",
11   "x": -80.38,
12   "y": 152.67,
13   "trs": { "color": "red" }
14
15
16   "wokwi-resistor",
17   "": "r1",
18   "x": 20.29,
19   "y": 184.66,
20   "trs": { "value": "1000" }
21
22
23   tions": [
24     "GND.1", "led1:C", "black", [ "v-157.64", "h2.49" ] ],
25     trasonic1:VCC", "uno:5V", "red", [ "v77.91", "h-219.78", "v229.3
26     trasonic1:ECHO", "uno:2", "blue", [ "v101.24", "h-1.56" ] ],
27     trasonic1:TRIG", "uno:3", "cyan", [ "v103.91", "h-2.34" ] ],
28     trasonic1:GND", "uno:GND.1", "black", [ "v39.24", "h-127.45" ] ] ]
```

## Solution run:

The screenshot shows the Wokwi IDE interface. On the left, the `sketch.ino` file contains the following code:

```
1 #define ECHO_PIN 1
2 #define TRIG_PIN 9
3
4
5 void setup() {
6   Serial.begin(115200);
7   pinMode(LED_BUILTIN, OUTPUT);
8   pinMode(TRIG_PIN, OUTPUT);
9   pinMode(ECHO_PIN, INPUT);
10 }
11
12 float readDistanceCM() {
13   digitalWrite(TRIG_PIN, LOW);
14   delayMicroseconds(2);
15   digitalWrite(TRIG_PIN, HIGH);
16   delayMicroseconds(10);
17   int duration = pulseIn(ECHO_PIN, HIGH);
18   return duration * 5.044/2;
19 }
20
21 void loop() {
22   float distance = readDistanceCM();
23   bool isNearby = distance < 100;
24   digitalWrite(LED_BUILTIN, isNearby);
25   Serial.print("Measured distance: ");
26   Serial.println(readDistanceCM());
27   delay(100);
28 }
```

On the right, the simulation shows an Arduino Uno connected to an HC-SR04 ultrasonic sensor. The sensor's VCC is connected to the Arduino's 5V pin, GND to GND, Trig to pin 9, and Echo to pin 1. A red LED is connected to the Arduino's GND pin. The simulation output shows three consecutive "Measured distance: 22.70" readings.

## OUTPUT:

DATA IS SENT TO IBM CLOUD WHEN NO OBJECT IS DETECTED

The screenshot shows the IBM Cloud IoT Platform console. The top navigation bar includes "Browse", "Action", "Device Types", and "Interfaces". A sidebar on the left contains icons for various functions. The main content area displays the "Recent Events" for a device named "ultrasonicsensor\_1". The device is connected and the last event was received on 26 Oct 2022 23:05.

Event	Value	Format	Last Received
ultrasonic	{"measured distance":3}	json	a few seconds ago
ultrasonic	{"measured distance":23}	json	a few seconds ago
ultrasonic	{"measured distance":21}	json	a few seconds ago
ultrasonic	{"measured distance":50}	json	a few seconds ago
ultrasonic	{"measured distance":71}	json	a few seconds ago

When no object is detected :

