

ASSESSMENT-4

ASSESSMENT DATE	05 November 2022
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MARKS	2 Marks

PROBLEM:

CODE:

```
#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);
}
```

SIMULATION:

The screenshot displays the Wokwi web IDE interface. On the left, the sketch code is shown, which defines pins for an ultrasonic sensor and an LED, and implements a distance-measuring function. The right panel shows the simulation of the hardware, including an Arduino Uno, an HC-SR04 sensor, and a red LED. The simulation output window displays a series of 'Measured distance' values.

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

Simulation Output:

```
Measured distance: 62.88
Measured distance: 62.88
Measured distance: 62.97
Measured distance: 62.88
Measured distance: 62.88
Measured distance: 62.88
Measured distance: 62.88
Measured distance: 62.97
```

Link: <https://wokwi.com/projects/347467477102363218>

When object distance is >100:

The screenshot shows the 'Recent Events' tab in the Wokwi web IDE. The table displays a live stream of data from the device, showing distance measurements and object status. The simulation is running.

Event	Value	Format	Last Received
event_1	{"Distance":313,"Object":"No"}	json	a few seconds ago
event_1	{"Distance":251,"Object":"No"}	json	a few seconds ago
event_1	{"Distance":145,"Object":"No"}	json	a few seconds ago
event_1	{"Distance":140,"Object":"No"}	json	a few seconds ago
event_1	{"Distance":369,"Object":"No"}	json	a few seconds ago

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1 Simulation running

The screenshot shows the IoT Studio interface for a NodeMCU device. The top navigation bar includes 'Browse', 'Action', 'Device Types', and 'Interfaces'. The main header has a search bar 'Search by Device ID' and a 'Device Simulator' toggle. The device page for '123456' shows it is 'Disconnected'. The 'Recent Events' tab is active, displaying a table of events. A simulation status box at the bottom indicates '1 Simulation running'.

Event	Value	Format	Last Received
event_1	{"Alert Distance":95,"Object":"near"}	json	a few seconds ago
event_1	{"Alert Distance":14,"Object":"near"}	json	a few seconds ago
event_1	{"Alert Distance":8,"Object":"near"}	json	a few seconds ago
event_1	{"Alert Distance":13,"Object":"near"}	json	a few seconds ago
event_1	{"Alert Distance":5,"Object":"near"}	json	a few seconds ago