

**NAME: KSHITIJ GUPTA**  
**Enrolment Number: 21162101007**  
**Sub: IoT**  
**Practical – 4[Batch-71]**

## **Interface Ultrasonic Sensor with Arduino**

### **Parts needed:**

**Arduino uno**

**Jumper wires**

**sonic sensor**

## Code:-

```
const int trigPin = 9;
const int echoPin = 10;

long duration;
int distance;
void setup() {
    pinMode(trigPin, OUTPUT);
    pinMode(echoPin, INPUT);
    Serial.begin(9600);
}
void loop() {

    digitalWrite(trigPin, LOW);
    delayMicroseconds(1000);

    digitalWrite(trigPin, HIGH);
    delayMicroseconds(1000);
    digitalWrite(trigPin, LOW);

    duration = pulseIn(echoPin, HIGH);

    distance = duration * 0.034 / 2;
    Serial.print("Distance: ");
    Serial.println(distance);
    delay(1000);
}
```

Wokwi New Arduino Uno Project - Wokwi

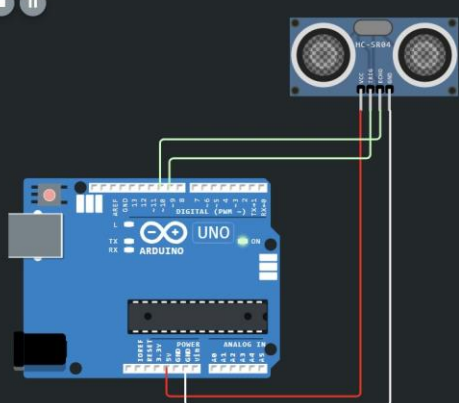
WOKWI SAVE SHARE Docs RUN UP

sketch.ino diagram.json Library Manager

```
1 const int trigPin = 9;
2 const int echoPin = 10;
3
4 long duration;
5 int distance;
6 void setup() {
7   pinMode(trigPin, OUTPUT);
8   pinMode(echoPin, INPUT);
9   Serial.begin(9600);
10 }
11 void loop() {
12   digitalWrite(trigPin, LOW);
13   delayMicroseconds(1000);
14
15   digitalWrite(trigPin, HIGH);
16   delayMicroseconds(1000);
17   digitalWrite(trigPin, LOW);
18
19   duration = pulseIn(echoPin, HIGH);
20
21   distance = duration * 0.034 / 2;
22   Serial.print("Distance: ");
23   Serial.println(distance);
24   delay(1000);
25 }
26
```

Simulation

Distance: 273  
Distance: 273  
Distance: 273  
Distance: 273  
Distance: 273  
Distance: 273  
Distance: 273



Wokwi New Arduino Uno Project - Wokwi

WOKWI SAVE SHARE Docs RUN UP

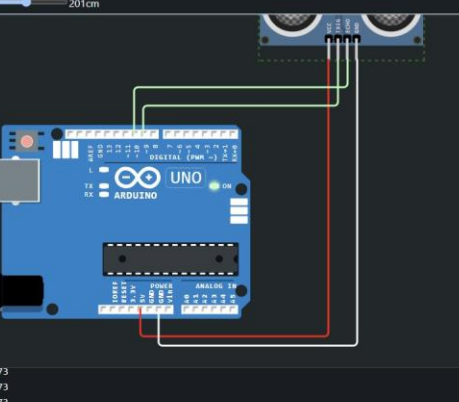
sketch.ino diagram.json Library Manager

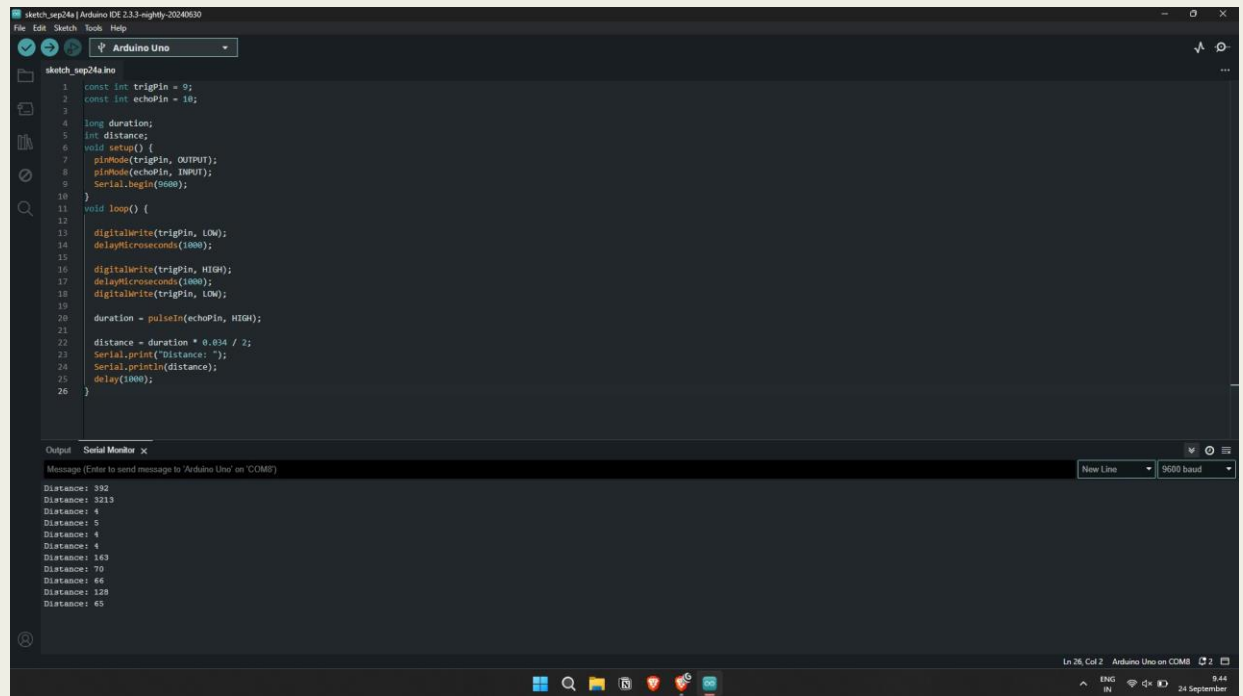
```
1 const int trigPin = 9;
2 const int echoPin = 10;
3
4 long duration;
5 int distance;
6 void setup() {
7   pinMode(trigPin, OUTPUT);
8   pinMode(echoPin, INPUT);
9   Serial.begin(9600);
10 }
11 void loop() {
12   digitalWrite(trigPin, LOW);
13   delayMicroseconds(1000);
14
15   digitalWrite(trigPin, HIGH);
16   delayMicroseconds(1000);
17   digitalWrite(trigPin, LOW);
18
19   duration = pulseIn(echoPin, HIGH);
20
21   distance = duration * 0.034 / 2;
22   Serial.print("Distance: ");
23   Serial.println(distance);
24   delay(1000);
25 }
26
```

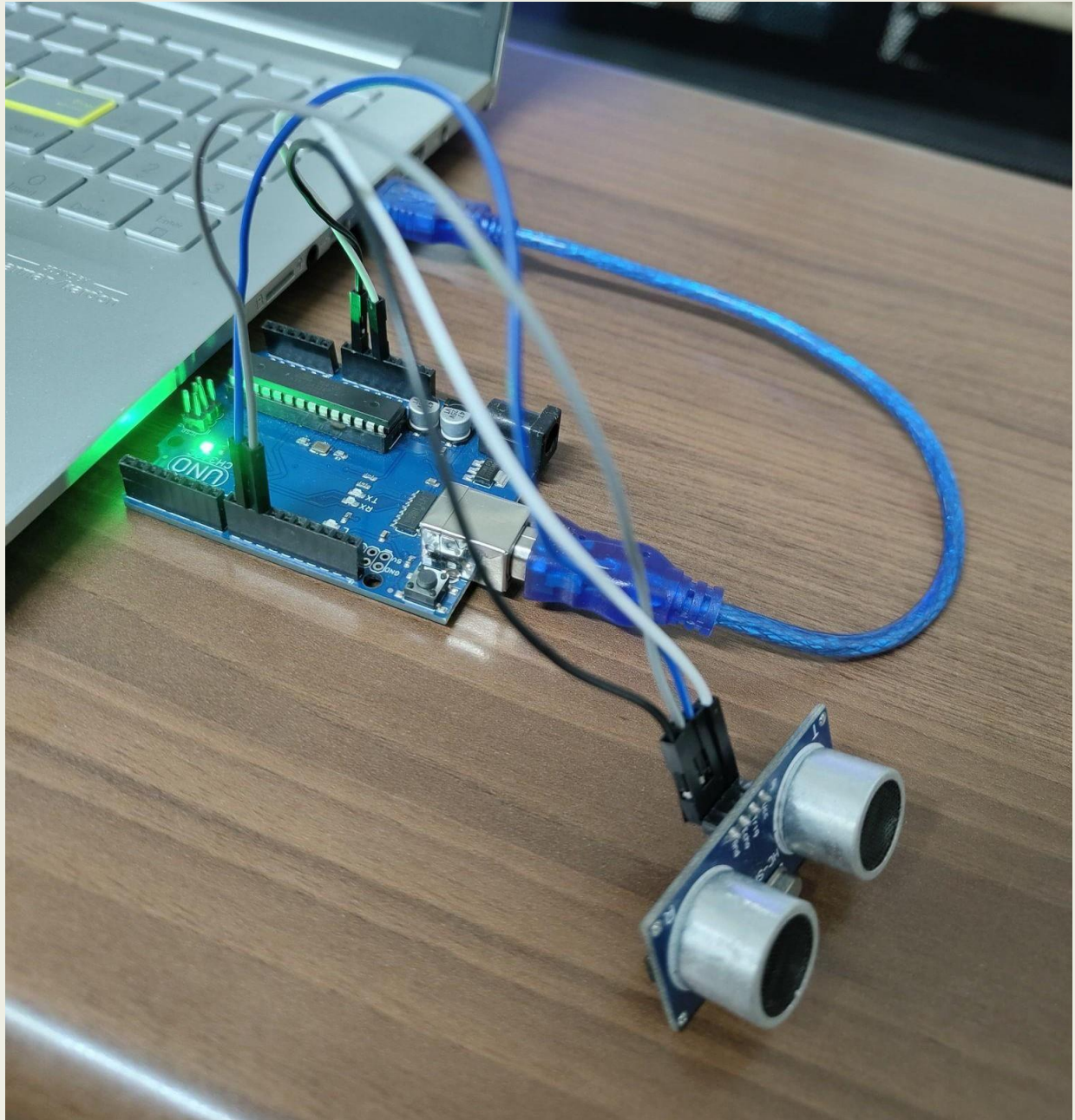
Simulation

Editing Ultrasonic Distance Sensor  
Distance: 201cm

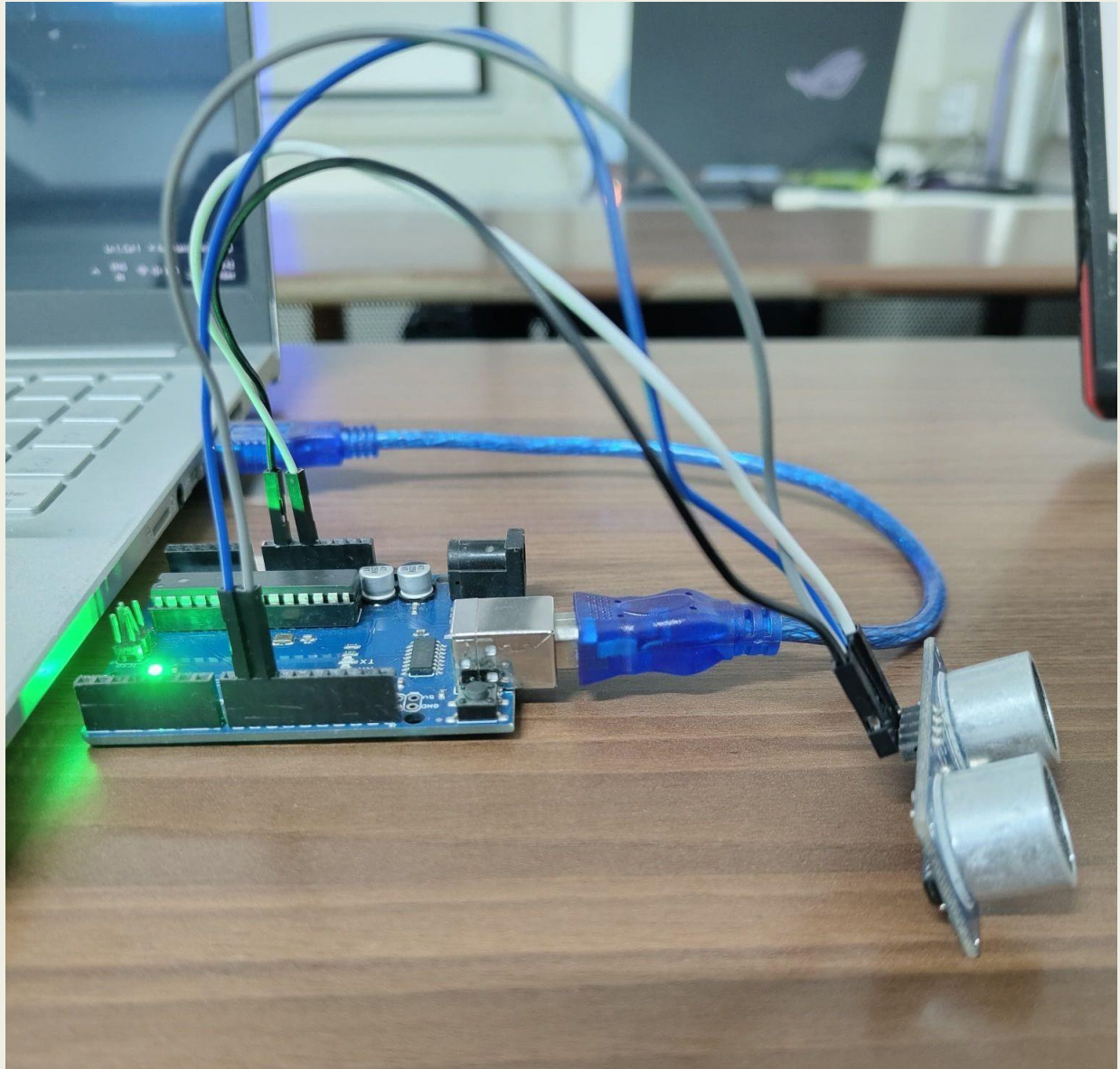
Distance: 273  
Distance: 273  
Distance: 273  
Distance: 273  
Distance: 199  
Distance: 199  
Distance: 199











# LED

## Parts needed:

- 1) Arduino uno
- 2) led
- 3) sonic sensor
- 4) Jumper wires

```
// Pin definitions
const int trigPin = 9;
const int echoPin = 8;
const int nearLedPin = 13;
const int farLedPin = 12;

void setup() {
    pinMode(trigPin, OUTPUT);
    pinMode(echoPin, INPUT);
    pinMode(nearLedPin, OUTPUT);
    pinMode(farLedPin, OUTPUT);

    Serial.begin(9600); // For distance output
}

void loop() {
    // Send pulse
    digitalWrite(trigPin, LOW);
    delayMicroseconds(2);
    digitalWrite(trigPin, HIGH);
    delayMicroseconds(10);
    digitalWrite(trigPin, LOW);

    // Read pulse duration and calculate distance
    long duration = pulseIn(echoPin, HIGH);
    int distance = duration * 0.034 / 2;

    // Output distance
    Serial.println(distance);

    // Control LEDs based on distance
    if (distance <= 50) {
        digitalWrite(nearLedPin, HIGH);
```

```

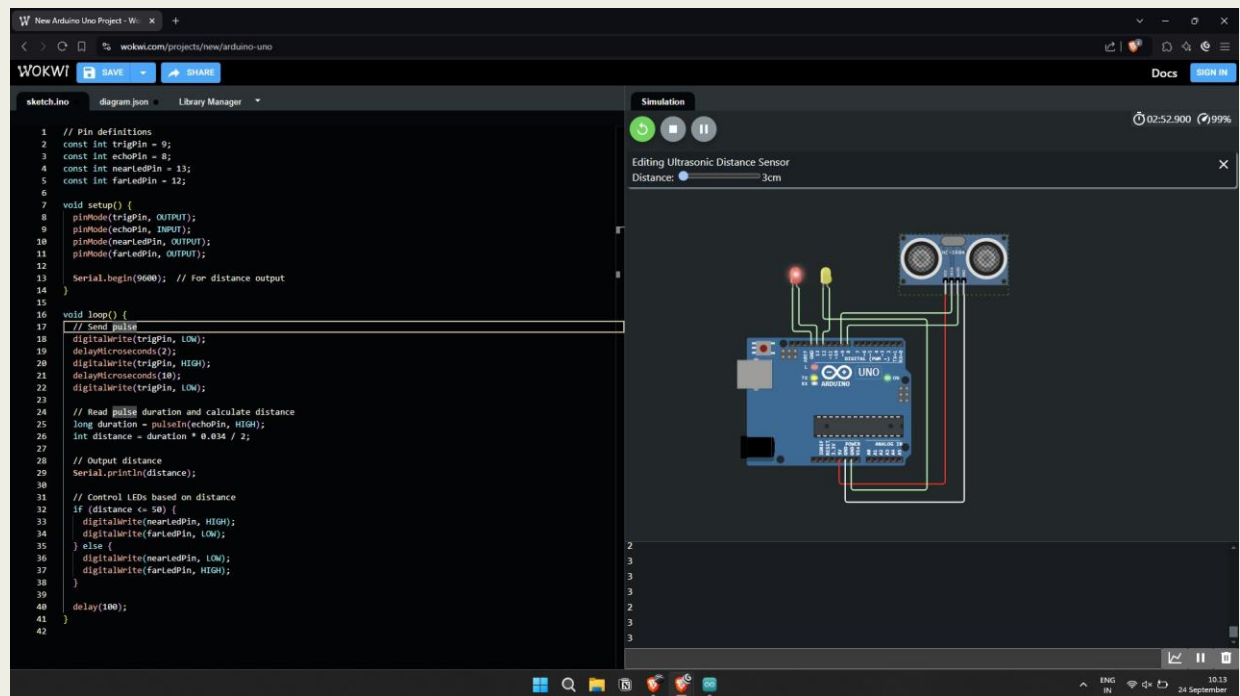
    digitalWrite(farLedPin, LOW);

} else {

    digitalWrite(nearLedPin, LOW);
    digitalWrite(farLedPin, HIGH);

    delay(100);
}

```





New Arduino Uno Project - Wokwi

wokwi.com/projects/new/arduino-uno

WOKWI [SAVE](#) [SHARE](#) Docs [SIGN UP](#)

sketch.ino [Diagram](#) [Join](#) [Library Manager](#)

```
1 // Pin definitions
2 const int trigPin = 9;
3 const int echoPin = 8;
4 const int nearLedPin = 13;
5 const int farLedPin = 12;
6
7 void setup() {
8   pinMode(trigPin, OUTPUT);
9   pinMode(echoPin, INPUT);
10  pinMode(nearLedPin, OUTPUT);
11  pinMode(farLedPin, OUTPUT);
12
13  Serial.begin(9600); // for distance output
14
15
16 void loop() {
17   // Send pulse
18   digitalWrite(trigPin, LOW);
19   delayMicroseconds(2);
20   digitalWrite(trigPin, HIGH);
21   delayMicroseconds(10);
22   digitalWrite(trigPin, LOW);
23
24   // Read pulse duration and calculate distance
25   long duration = pulseIn(echoPin, HIGH);
26   int distance = duration * 0.034 / 2;
27
28   // Output distance
29   Serial.println(distance);
30
31   // Control LEDs based on distance
32   if (distance <= 50) {
33     digitalWrite(nearLedPin, HIGH);
34     digitalWrite(farLedPin, LOW);
35   } else {
36     digitalWrite(nearLedPin, LOW);
37     digitalWrite(farLedPin, HIGH);
38   }
39   delay(100);
40 }
41
42
```

Simulation

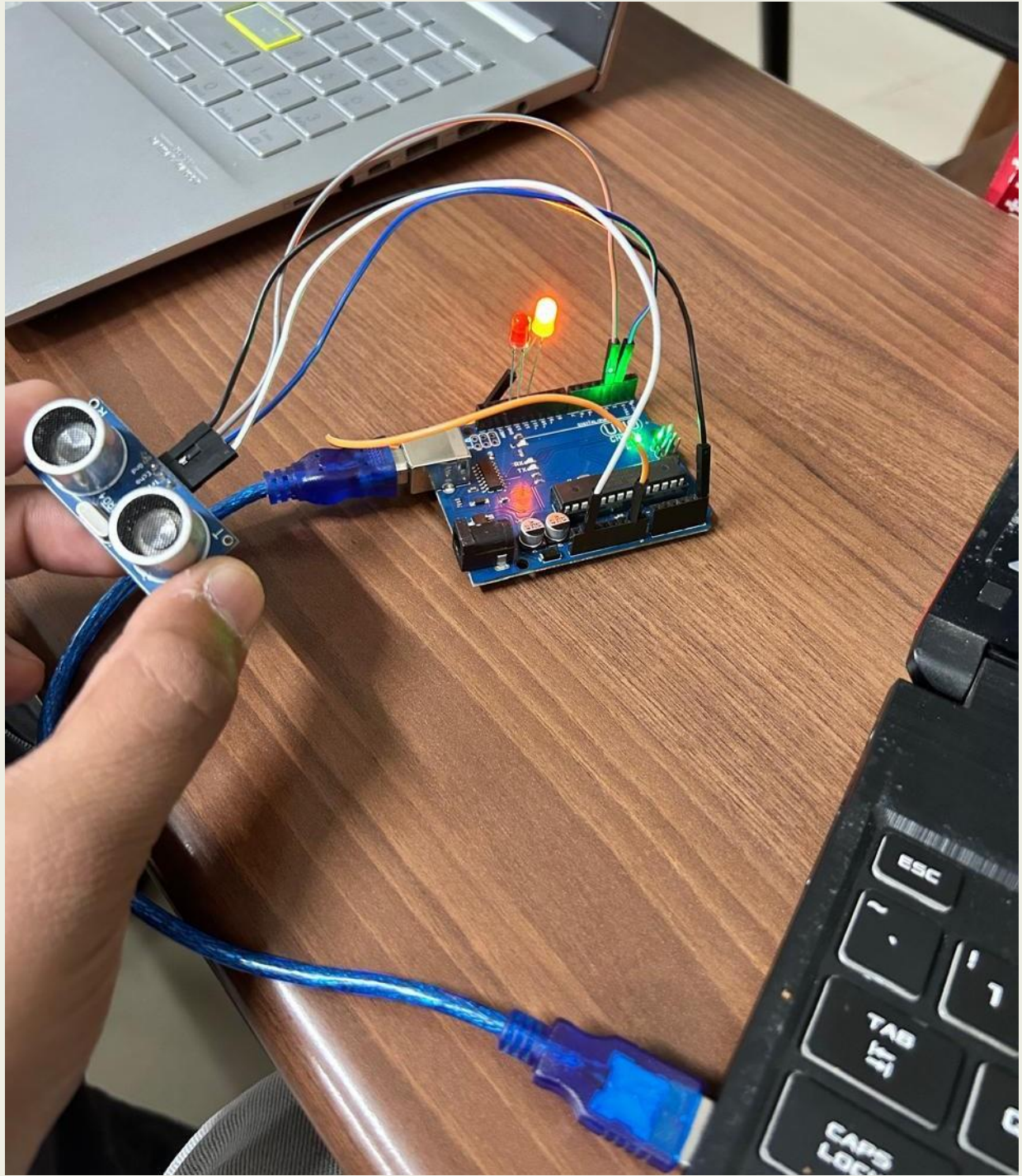
03:02.063 99%

Editing Ultrasonic Distance Sensor

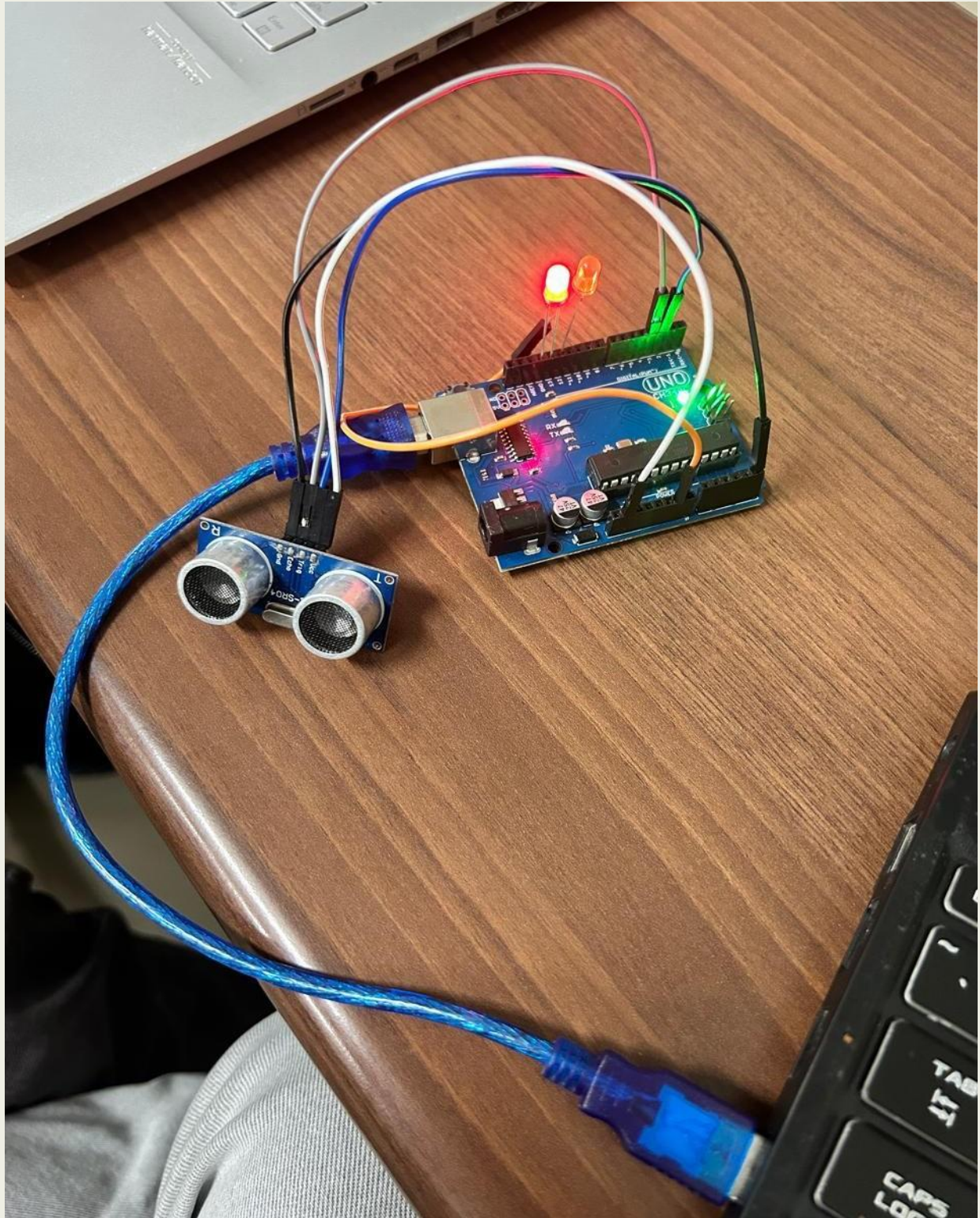
Distance:  243cm

241  
241  
241  
241  
241  
241

10:13  
24 September







## buzzer

### Parts needed:

- 1) Arduino uno
- 2) buzzer
- 3) sonic sensor
- 4) Jumper wires

```
#define echoPin 8
#define trigPin 10
const int buzzer = 9;

//define variables
long duration;
int distance;

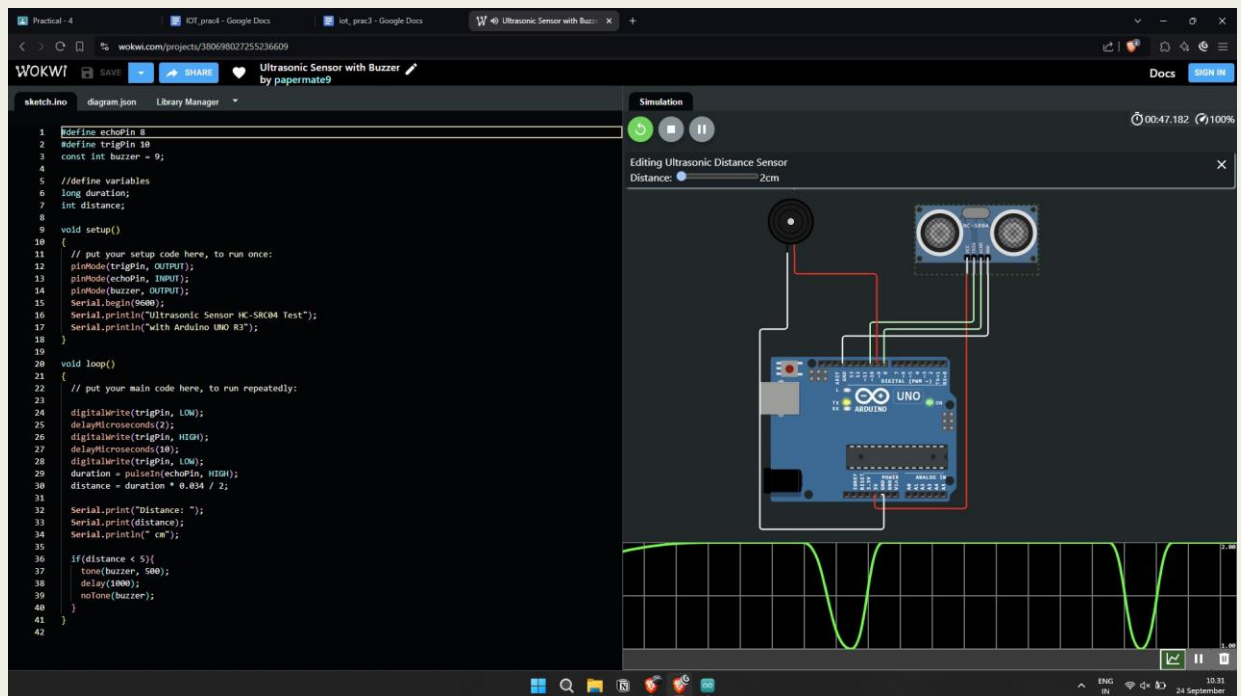
void setup()
{
    // put your setup code here, to run once:
    pinMode(trigPin, OUTPUT);
    pinMode(echoPin, INPUT);
    pinMode(buzzer, OUTPUT);
    Serial.begin(9600);
    Serial.println("Ultrasonic Sensor HC-SRC04 Test");
    Serial.println("with Arduino UNO R3");
}

void loop()
{
    // put your main code here, to run repeatedly:

    digitalWrite(trigPin, LOW);
    delayMicroseconds(2);
    digitalWrite(trigPin, HIGH);
    delayMicroseconds(10);
    digitalWrite(trigPin, LOW);
    duration = pulseIn(echoPin, HIGH);
    distance = duration * 0.034 / 2;
```

```
Serial.print("Distance: ");  
Serial.print(distance);
```

```
if(distance < 5){  
    tone(buzzer, 500);  
    delay(1000);  
    noTone(buzzer);  
}
```





```
sketch_sep24a | Arduino IDE 2.3.3-nightly-20240630
File Edit Sketch Tools Help
sketch_sep24a.ino
1 #define echoPin 8
2 #define trigPin 10
3 const int buzzer = 9;
4
5 //define variables
6 long duration;
7 int distance;
8
9 void setup()
10 {
11   // put your setup code here, to run once:
12   pinMode(trigPin, OUTPUT);
13   pinMode(echoPin, INPUT);
14   pinMode(buzzer, OUTPUT);
15   Serial.begin(9600);
16   Serial.println("Ultrasonic Sensor HC-SR04 Test");
17   Serial.println("with Arduino UNO R3");
18 }
19
20 void loop()
21 {
22   // put your main code here, to run repeatedly:
23
24   digitalWrite(trigPin, LOW);
25   delayMicroseconds(2);
26   digitalWrite(trigPin, HIGH);
27   delayMicroseconds(10);
28   digitalWrite(trigPin, LOW);
29   duration = pulseIn(echoPin, HIGH);
30   distance = duration * 0.034 / 2;
31
32   Serial.print("Distance: ");
33   Serial.print(distance);
34   Serial.println(" cm");
35
36   if (distance < 5){
37     tone(buzzer, 500);
38     delay(1000);
39     noTone(buzzer);
40   }
41 }
42
Output Serial Monitor
Sketch uses 3124 bytes (9%) of program storage space. Maximum is 32256 bytes.
Global variables use 200 bytes (0%) of dynamic memory, leaving 1848 bytes for local variables. Maximum is 2048 bytes.
Ln 37, Col 23 Arduino Uno on COM8 [not connected] 10:32
24 September
```

