Assignment - 1

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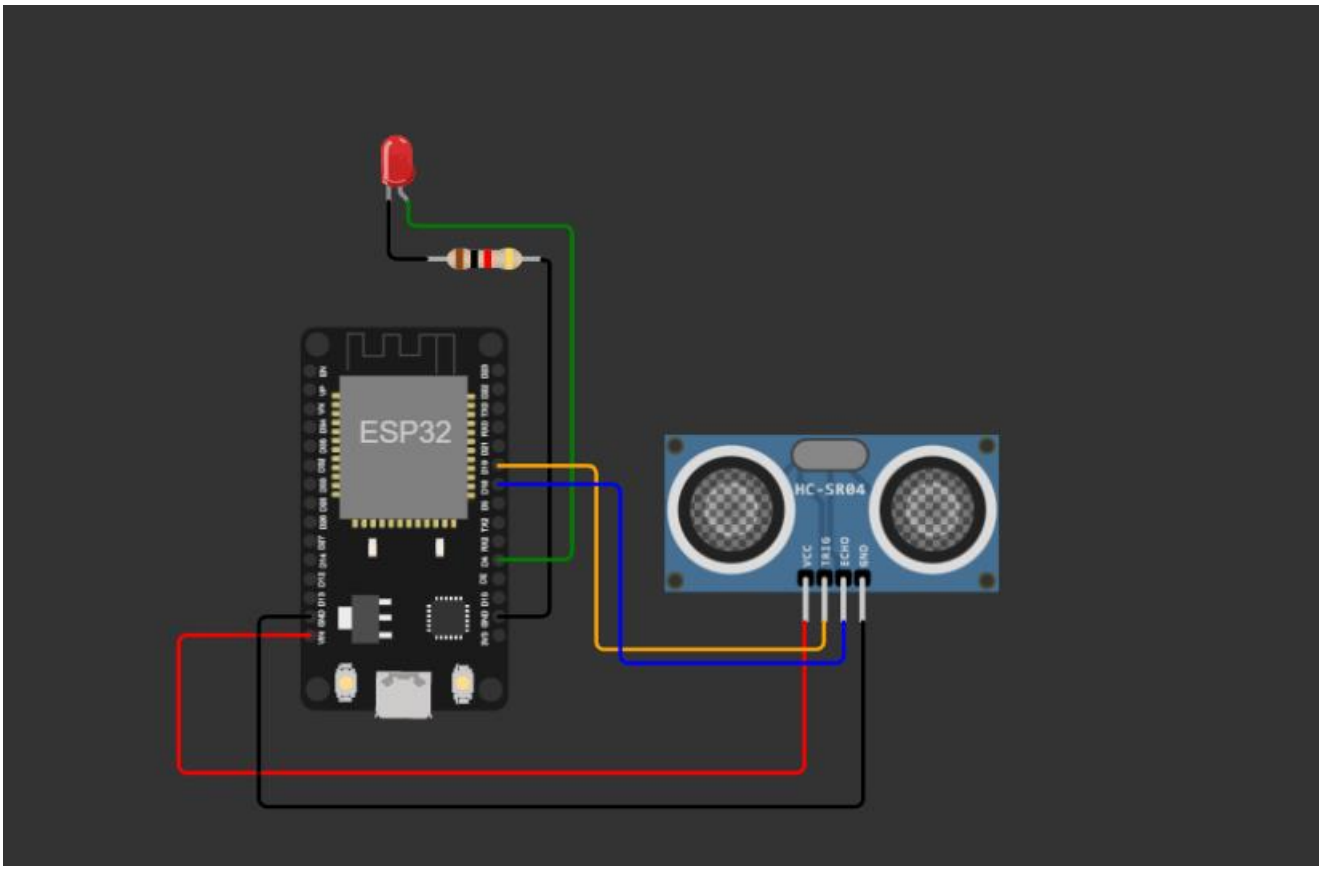
20BCT0117

Date: 19/05/23

Ultrasonic Sensor and LED

Q- Using ESP32, make a circuit in Wokwi such that if the distance from the ultrasonic sensor becomes less than 100cm, it turns on the led.

Circuit:



Code:

```
const int led = 4;
const int trig = 19;
const int echo = 18;

void setup() {
    pinMode(led, OUTPUT);
    pinMode(trig, OUTPUT);
    pinMode(echo, INPUT);
}

void loop() {
    float duration, distance;
    digitalWrite(trig, HIGH);
    delayMicroseconds(10);
    digitalWrite(trig, LOW);
    duration = pulseIn(echo, HIGH);
    distance = (duration * 0.0172);
    if (distance < 100){
      digitalWrite(led,HIGH);
    }
    else {
      digitalWrite(led,LOW);
    }
}
```

Calculations:

Considering,

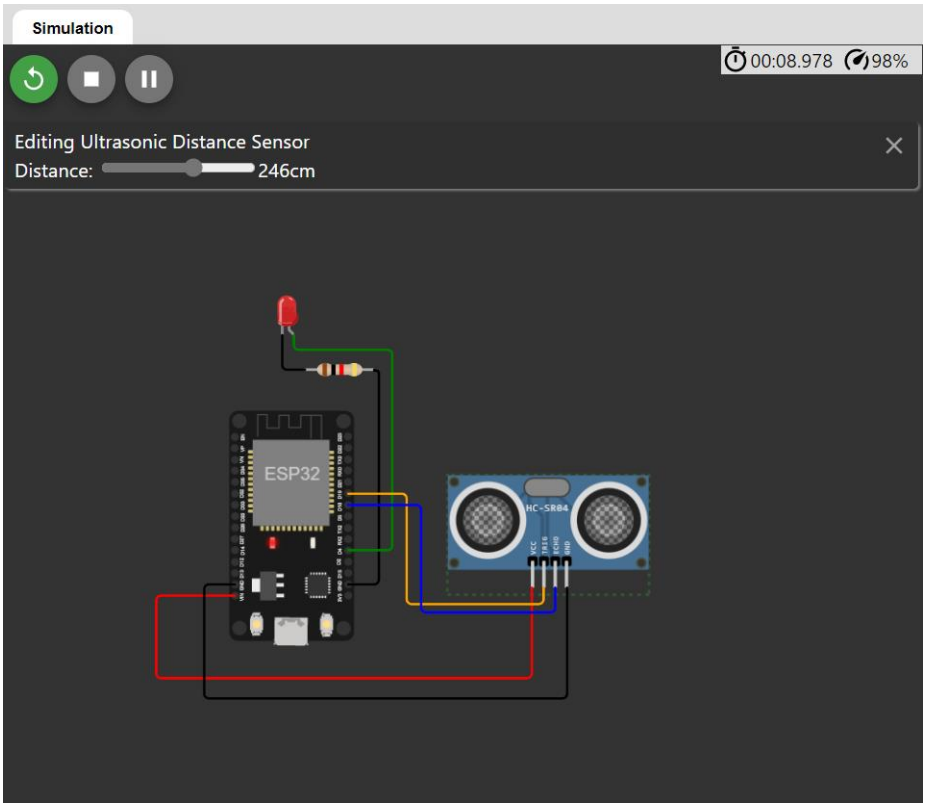
Speed of sound in dry air at 20 °C = 343 m / s = 0.0343 cm/µs

For calculating distance, we divide it by 2 as the signal will be detected will take the time of a round trip.

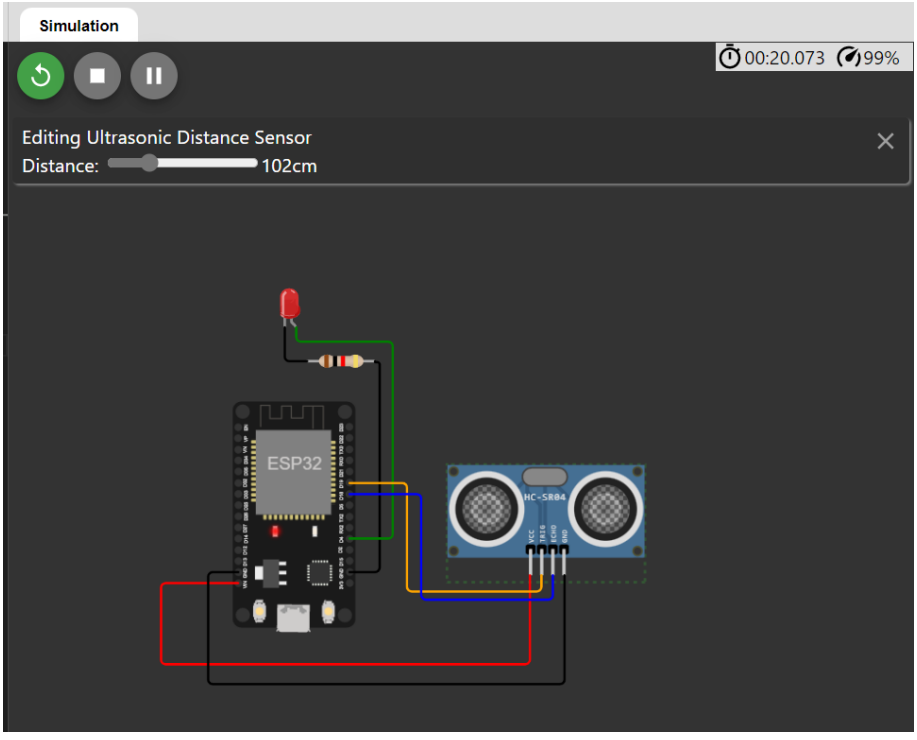
Therefore the distance is calculated as time * speed / 2 → duration * 0.0343/2 cm/µs = duration * 0.0172

Simulation:

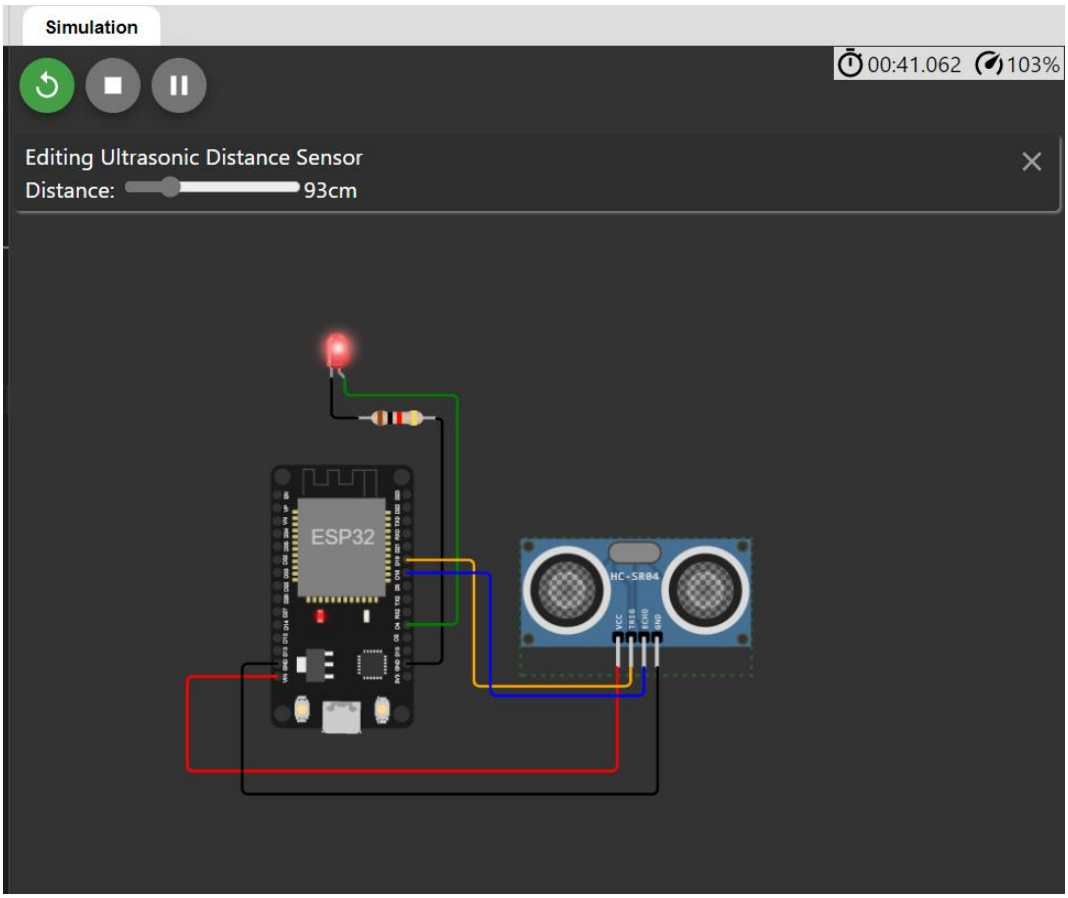
- ***Distance > 100cm***



- ***Distance > 100cm***



- ***Distance < 100cm***



Wokwi Project Link:

[Assignment1 UltraESP - Wokwi ESP32, STM32, Arduino Simulator]