Jose Rizal University

College of Computer Studies Engineering

Computer Engineering Department

Lab Exam Simulation Activity

CPE C312 – EMBEDDED SYSTEMS

Submitted by:

Exiquiel John A. Pines

Submitted to:

Engr. Nastaran Rezanazarzadeh

Date Submitted:

September 22, 2023

Output:

```
// Lab Exam Simulation Activity
// Exiquiel John A. Pines || BSCPE-401G

// Define pins
const int redLED = 8; const int blueLED = 9; const int greenLED = 10;
const int piezoPin = 11;
const int trigPin = 3; const int echoPin = 2;

// Variables long duration; int distanceCm; int distanceIn;

void setup() {
  pinMode(redLED, OUTPUT);
  pinMode(blueLED, OUTPUT);
  pinMode(greenLED, OUTPUT);
  pinMode(piezoPin, OUTPUT);
  pinMode(trigPin, OUTPUT); pinMode(echoPin, INPUT);

// Initialize serial communication Serial.begin(9600); Serial.println("Serial Started...");
}

void loop()
{
  noTone(piezoPin);
  digitalWrite(trigPin, LOW);
  digitalWrite(trigPin, HIGH);
  digitalWrite(trigPin, LOW);

  int duration = pulseIn(echoPin, HIGH);
  distanceCm = duration*0.034/2;
  distanceIn = duration*0.0133/2;

  // Print the distance to the serial monitor

  Serial.print("Distance: ");
  Serial.print(distanceCm);
  Serial.println(" cm");

  // Red LED on, danger sound on piezo
  if (distanceCm<50) {
    digitalWrite(redLED, HIGH);
    digitalWrite(blueLED, LOW);
    digitalWrite(greenLED, LOW);

    tone(piezoPin, 2000);
  }

  // Blue LED on, hazard sound on piezo
  else if (distanceCm>=50 && distanceCm<=70) {
    digitalWrite(redLED, LOW);
    digitalWrite(blueLED, HIGH);
    digitalWrite(greenLED, LOW);

    tone(piezoPin, 1000);
  }

  // green LED on, safe sound on piezo
  if (distanceCm>=100){
    digitalWrite(redLED, LOW);
    digitalWrite(blueLED, LOW);
    digitalWrite(greenLED, HIGH);

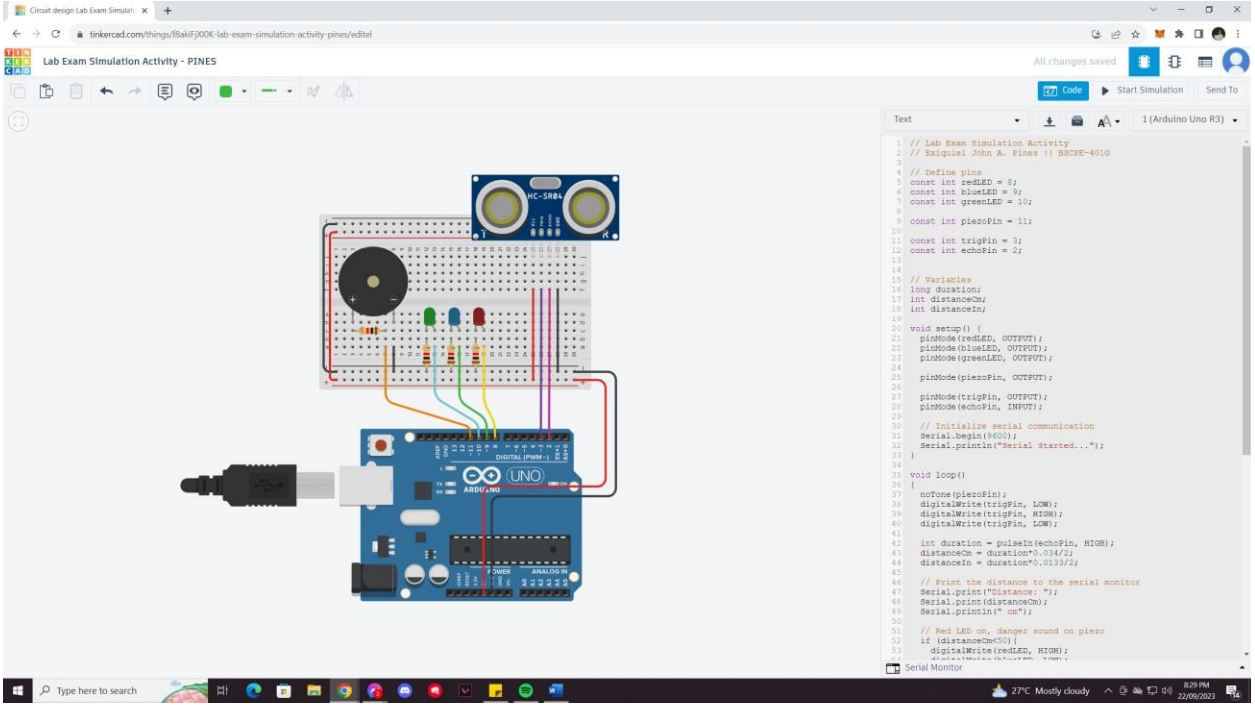
    tone(piezoPin, 500);
  }

  else {
    digitalWrite(redLED, LOW);
    digitalWrite(blueLED, LOW);
    digitalWrite(greenLED, LOW);

    noTone(piezoPin);
  }

  delay(100);
}
```

Output:



```
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// Exiquiel John A. Pines || BSCPE-401G

// Define pins
const int redLED = 8;
const int blueLED = 9;
const int greenLED = 10;

const int piezoPin = 11;

const int trigPin = 3;
const int echoPin = 2;


// Variables
long duration;
int distanceCm;
int distanceIn;

void setup() {
  pinMode(redLED, OUTPUT);
  pinMode(blueLED, OUTPUT);
  pinMode(greenLED, OUTPUT);

  pinMode(piezoPin, OUTPUT);

  pinMode(trigPin, OUTPUT);
  pinMode(echoPin, INPUT);

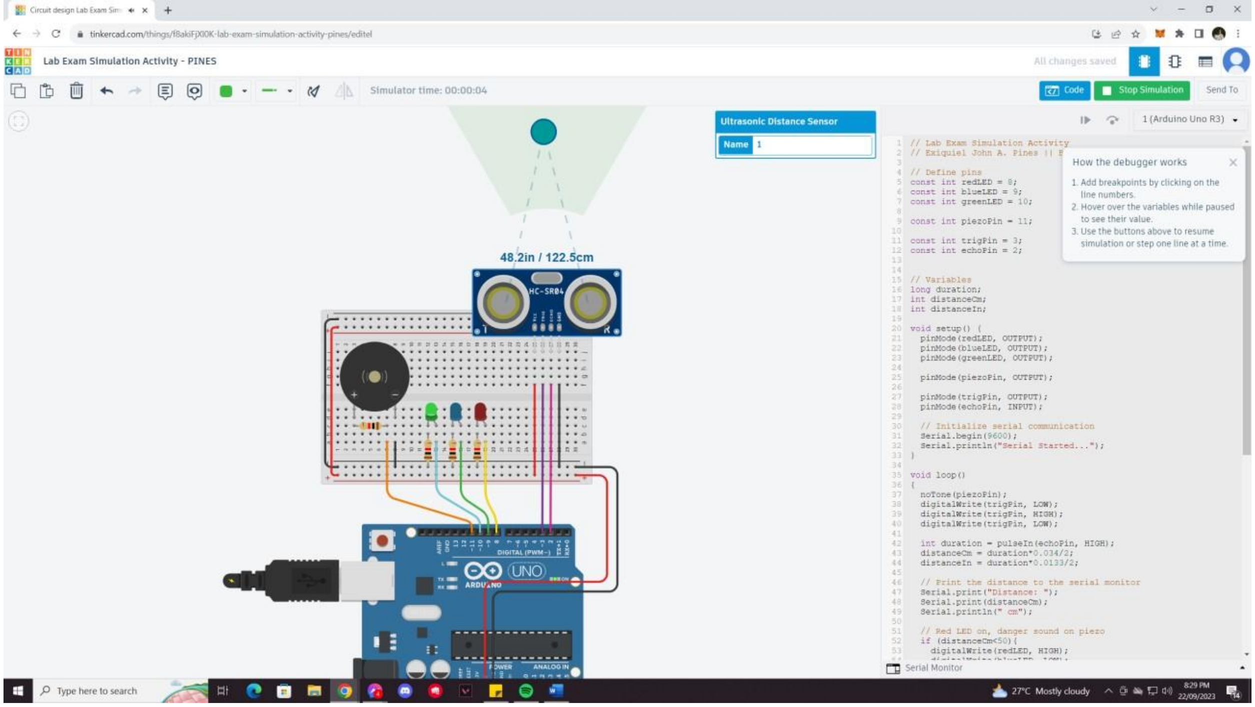
  // Initialize serial communication
  Serial.begin(9600);
  Serial.println("Serial Started...");
}

void loop()
{
  noTone(piezoPin);
  digitalWrite(trigPin, LOW);
  digitalWrite(trigPin, HIGH);
  digitalWrite(trigPin, LOW);

  int duration = pulseIn(echoPin, HIGH);
  distanceCm = duration*0.034/2;
  distanceIn = duration*0.0133/2;

  // Print the distance to the serial monitor
  Serial.print("Distance: ");
  Serial.print(distanceCm);
  Serial.println(" cm");

  // Red LED on, danger sound on piezo
  if (distanceCm<50){
    digitalWrite(redLED, HIGH);
```



Ultrasonic Distance Sensor

Name 1

How the debugger works

1. Add breakpoints by clicking on the line numbers.
2. Hover over the variables while paused to see their value.
3. Use the buttons above to resume simulation or step one line at a time.

```
// Lab Exam Simulation Activity
// Exiquiel John A. Pines || B

// Define pins
const int redLED = 8;
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const int piezoPin = 11;

const int trigPin = 3;
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// Variables
long duration;
int distanceCm;
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void setup() {
  pinMode(redLED, OUTPUT);
  pinMode(blueLED, OUTPUT);
  pinMode(greenLED, OUTPUT);

  pinMode(piezoPin, OUTPUT);

  pinMode(trigPin, OUTPUT);
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  // Initialize serial communication
  Serial.begin(9600);
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}

void loop()
{
  noTone(piezoPin);
  digitalWrite(trigPin, LOW);
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  int duration = pulseIn(echoPin, HIGH);
  distanceCm = duration*0.034/2;
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  // Print the distance to the serial monitor
  Serial.print("Distance: ");
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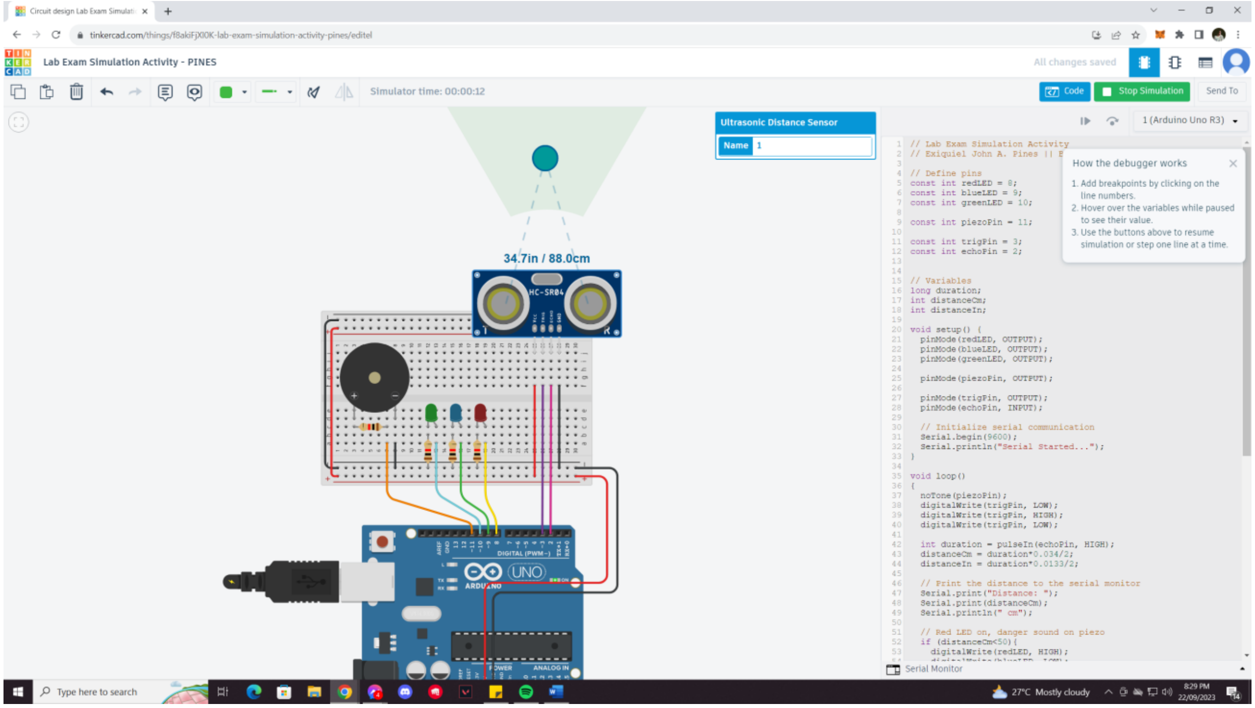
  Serial.println(" cm");

  // Red LED on, danger sound on piezo
  if (distanceCm<50){
    digitalWrite(redLED, HIGH);
```



Circuit design Lab Exam Simulati
tinkercad.com/things/f8akiFjX0OK-lab-exam-simulation-activity-pines/editel
Lab Exam Simulation Activity - PINES
All changes saved
Simulator time: 00:00:12
Code
Stop Simulation
Send To
Ultrasonic Distance Sensor
Name 1
34.7in / 88.0cm
HC-SR04
1 (Arduino Uno R3)
How the debugger works
1. Add breakpoints by clicking on the line numbers.
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Serial Monitor
Type here to search
27°C Mostly cloudy
8:29 PM
22/09/2023

```
// Lab Exam Simulation Activity
// Exiquiel John A. Pines || E

// Define pins
const int redLED = 8;
const int blueLED = 9;
const int greenLED = 10;

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const int echoPin = 2;


// Variables
long duration;
int distanceCm;
int distanceIn;

void setup() {
  pinMode(redLED, OUTPUT);
  pinMode(blueLED, OUTPUT);
  pinMode(greenLED, OUTPUT);

  pinMode(piezoPin, OUTPUT);

  pinMode(trigPin, OUTPUT);
  pinMode(echoPin, INPUT);

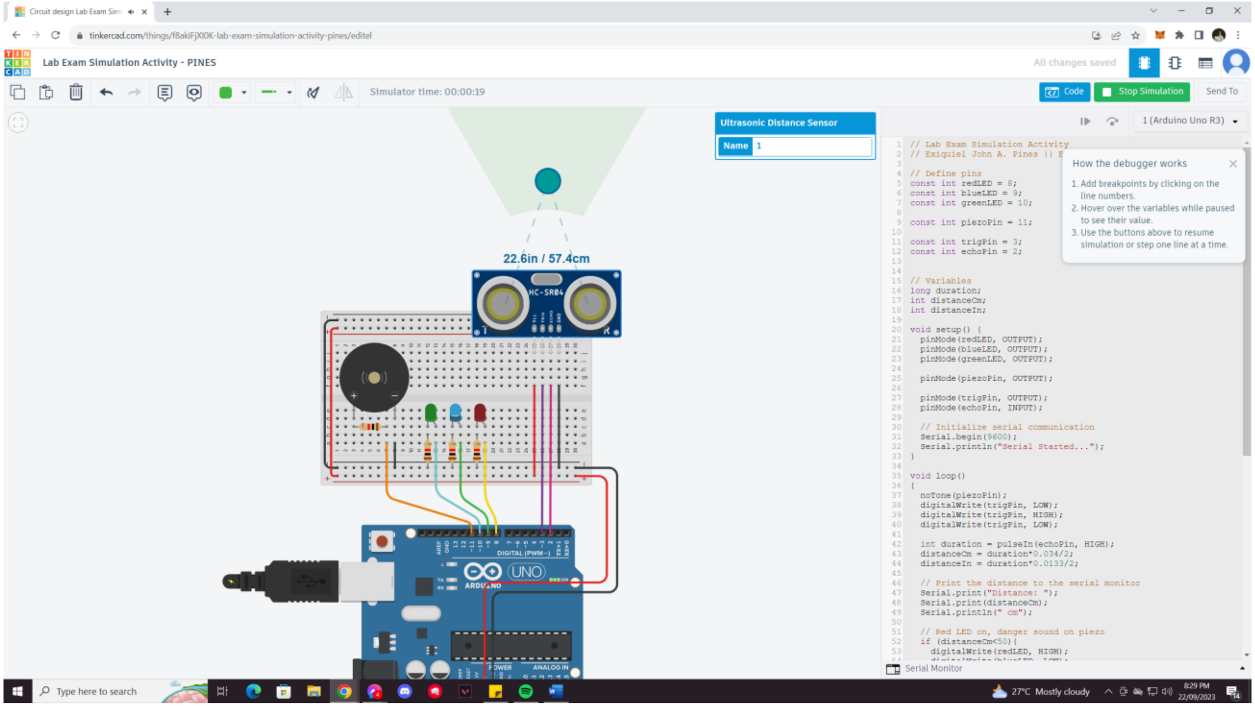
  // Initialize serial communication
  Serial.begin(9600);
  Serial.println("Serial Started...");
}

void loop()
{
  noTone(piezoPin);
  digitalWrite(trigPin, LOW);
  digitalWrite(trigPin, HIGH);
  digitalWrite(trigPin, LOW);

  int duration = pulseIn(echoPin, HIGH);
  distanceCm = duration*0.034/2;
  distanceIn = duration*0.0133/2;

  // Print the distance to the serial monitor
  Serial.print("Distance: ");
  Serial.print(distanceCm);
  Serial.println(" cm");

  // Red LED on, danger sound on piezo
  if (distanceCm<50){
    digitalWrite(redLED, HIGH);
```



Circuit design Lab Exam Sim
tinkercad.com/things/f8akiFjX0OK-lab-exam-simulation-activity-pines/editel
Lab Exam Simulation Activity - PINES
All changes saved
Simulator time: 00:00:19
Code
Stop Simulation
Send To
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22.6in / 57.4cm
HC-SR04
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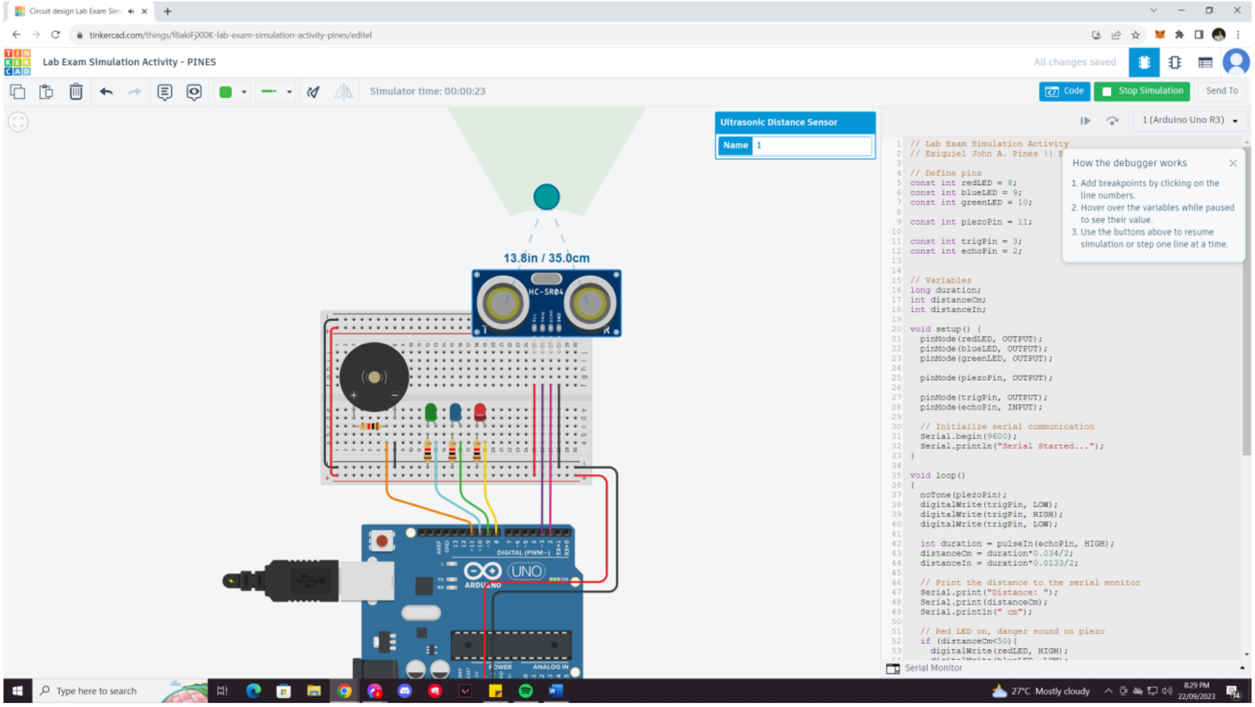
  // Red LED on, danger sound on piezo
  if (distanceCm<50){
    digitalWrite(redLED, HIGH);
```



Ultrasonic Distance Sensor

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