Microprocessor and Computer Architecture Laboratory

UE19CS256

4th Semester, Academic Year 2020-21

Date:30/03/2021

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Week#8 Program Number:1

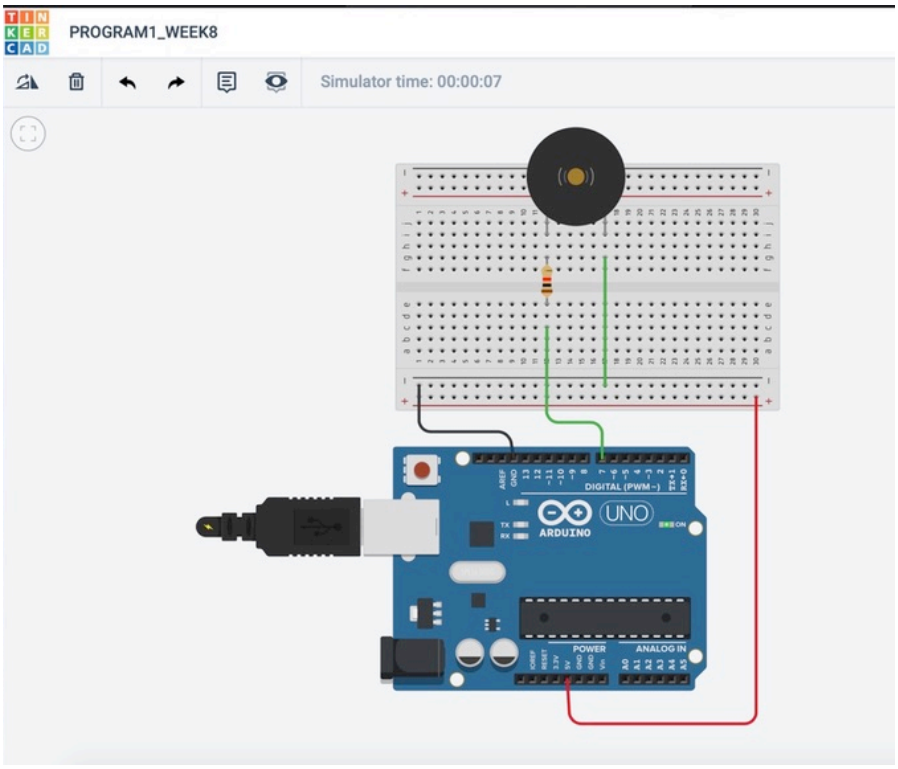
1. Implement a Buzzer with Arduino Simulation in Tinkercad

Arduino Code

```
int buzzer=7;
void setup()
{
  pinMode(buzzer, OUTPUT);
}

void loop()
{
  tone(buzzer,220,100);
  delay(1000);
}
```

Output Screen Shot


PROGRAM1_WEEK8
Simulator time: 00:00:07
DIGITAL (PWM~)
ARDUINO
UNO
POWER
ANALOG IN

Week#8 Program Number:2

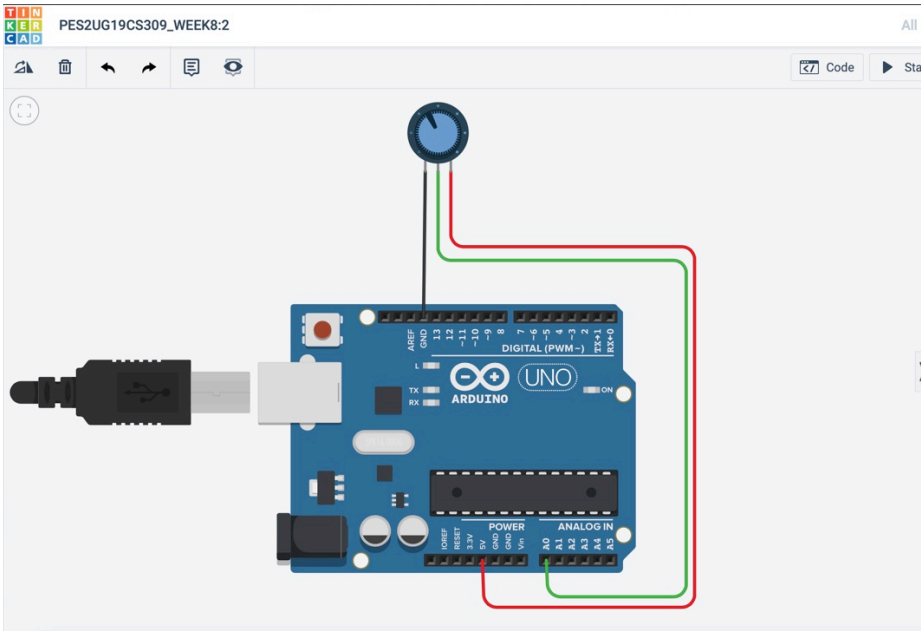
Implement a Tinkercad simulation that will read the value of a potentiometer and display it in serial monitor.

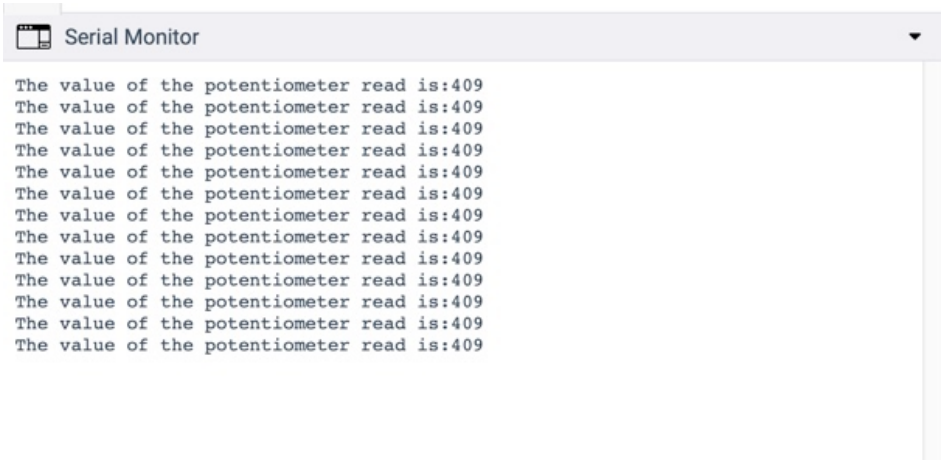
Arduino Code

```
int potentiometerVal = 0;
void setup()
{
  Serial.begin(9600); //Starting the potentiometer
}

void loop()
{
  potentiometerVal=analogRead(A0); // Reading the value from the analog pin A0
  Serial.print("The value of the potentiometer read is:");
  Serial.println(potentiometerVal);
  delay(180);
}
```

Output Screen Shot




Serial Monitor
The value of the potentiometer read is:409
The value of the potentiometer read is:409
The value of the potentiometer read is:409
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Week#8 Program Number: 3

Implement a Tinkercad simulation to measure a distance with the HC-SR04 ultrasonic sensor and show the result on the serial monitor.

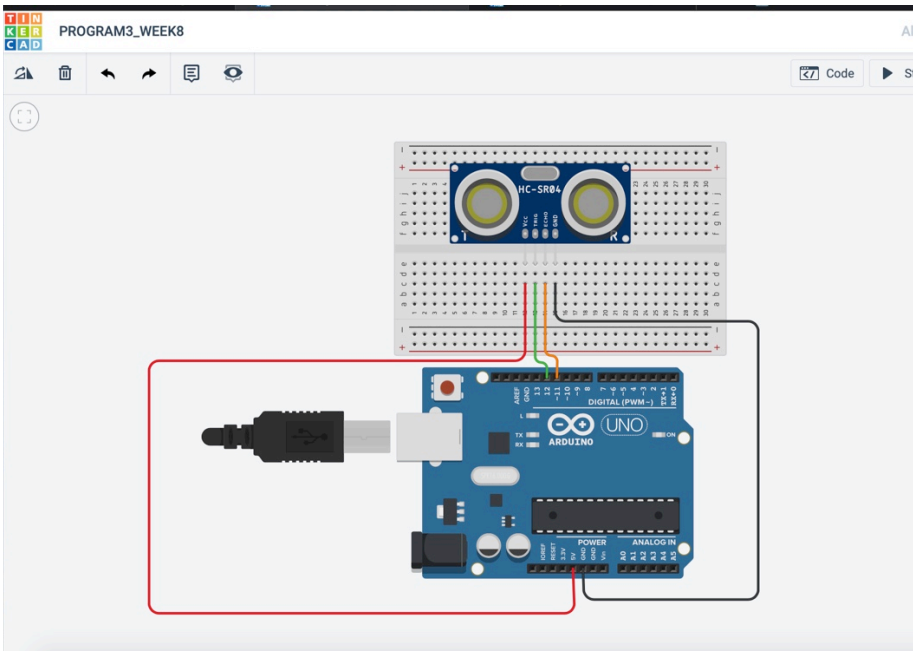
Arduino Code

Text 1 (Arduino Uno R3)

```
int trigger = 12; //Port number for trigger
int echo = 11; //Port number for echo
int inch; // Distance in inches
int cm; // Distance in centimeter

//Used to calculate time taken to strike the object and come back
//Here we initiate signals
int distance(int triggerPin, int echoPin)
{
  pinMode(triggerPin,OUTPUT);
  digitalWrite(triggerPin, LOW); //setting trigger port to 0;
  delayMicroseconds(2); //wait for 2 micro sec
  digitalWrite(triggerPin, HIGH); //setting trigger port to 1;
  delayMicroseconds(10); //wait for 10 micro sec
  digitalWrite(triggerPin, LOW);

  pinMode(echoPin,INPUT);
  return pulseIn(echo,HIGH);
}

void setup()
{
  Serial.begin(9600);
}

void loop()
{
  cm=0.01723 * distance(trigger,echo);
  inch=cm/2.54;
  Serial.print("Distance in centimeter=");
  Serial.println(cm);
  Serial.print("Distance in inch=");
  Serial.println(inch);
  delay(100);
}
```

Serial Monitor

Output Screen Shot



Serial Monitor

```
Distance in centimeter=113
Distance in inch=44
Distance in centimeter=113
Distance in inch=44
Distance in centimeter=113
Distance in inch=44
Distance in centimeter=113
Distance in inch=44
Distance in centimeter=113
Distance in inch=44
Distance in centimeter=113
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Distance in centimeter=113
Distance in inch=44
Distance in centimeter=113
Distance in inch=44
Distance in centimeter=113
Distance in inch=44
Distance in centimeter=113
Distance in inch=44
Distance in centimeter=113
```

Week#8 Program Number:4

Implement a Tinkercad simulation to sense movement in a room with a PIR motion sensor and Arduino's digital input.

Arduino Code

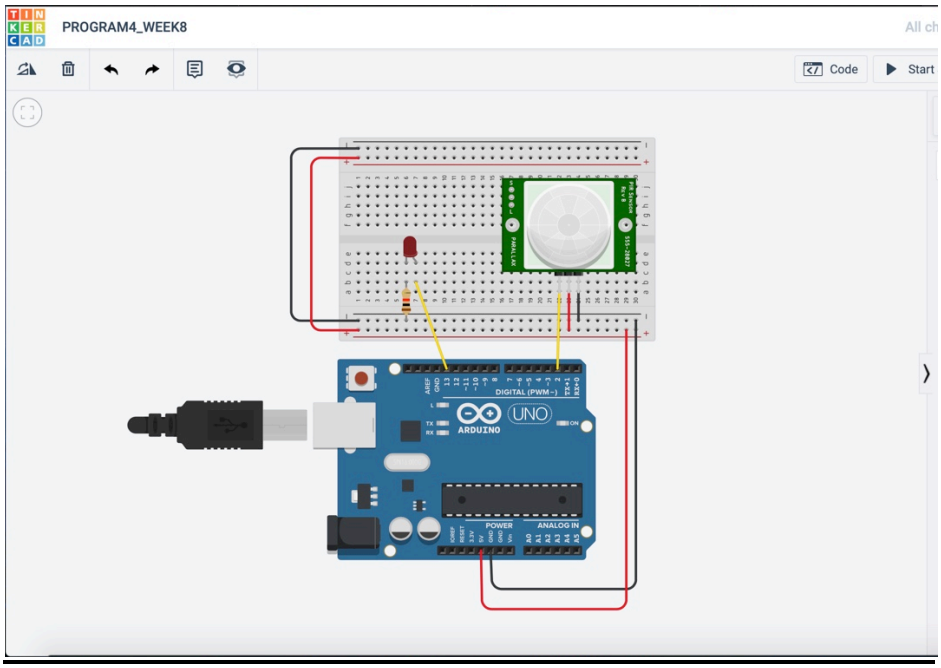
Text 1 (Arduino Uno R3)

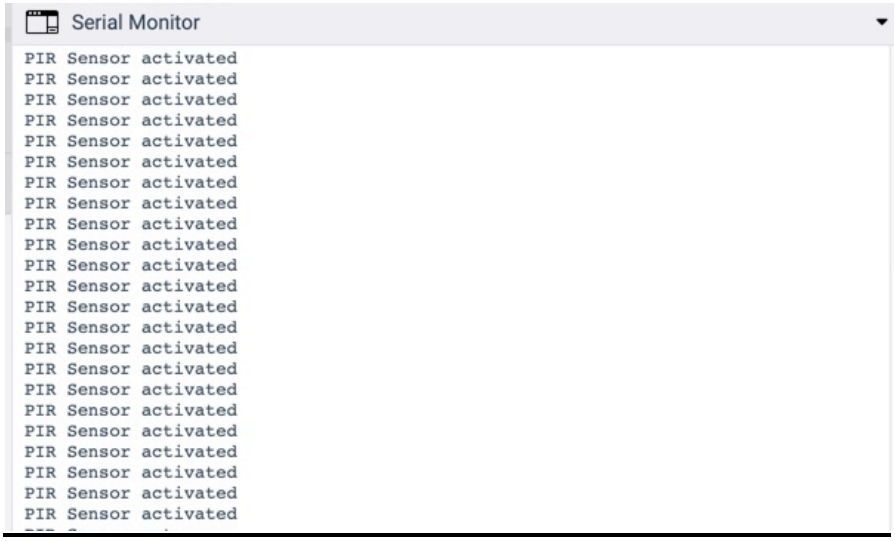
```
int sensorState = 0;
int sensor = 2;
int led=13;
void setup()
{
  pinMode(sensor, INPUT);
  pinMode(led, OUTPUT);
  Serial.begin(9600);

}

void loop()
{
  // Read the state of the PIR sensor/digital input
  sensorState = digitalRead(sensor); //Read from digital pin 2
  // check if sensor pin is HIGH. if it is, set the LED on.
  if (sensorState == HIGH)
  {
    digitalWrite(led, HIGH);
    Serial.println("PIR Sensor activated");
  }
  else
  {
    digitalWrite(led, LOW);
  }
  delay(10); // Delay a little bit to improve simulation performance
}
```

Output Screen Shot




Serial Monitor
PIR Sensor activated
PIR Sensor activated
PIR Sensor activated
PIR Sensor activated
PIR Sensor activated
PIR Sensor activated
PIR Sensor activated
PIR Sensor activated
PIR Sensor activated
PIR Sensor activated
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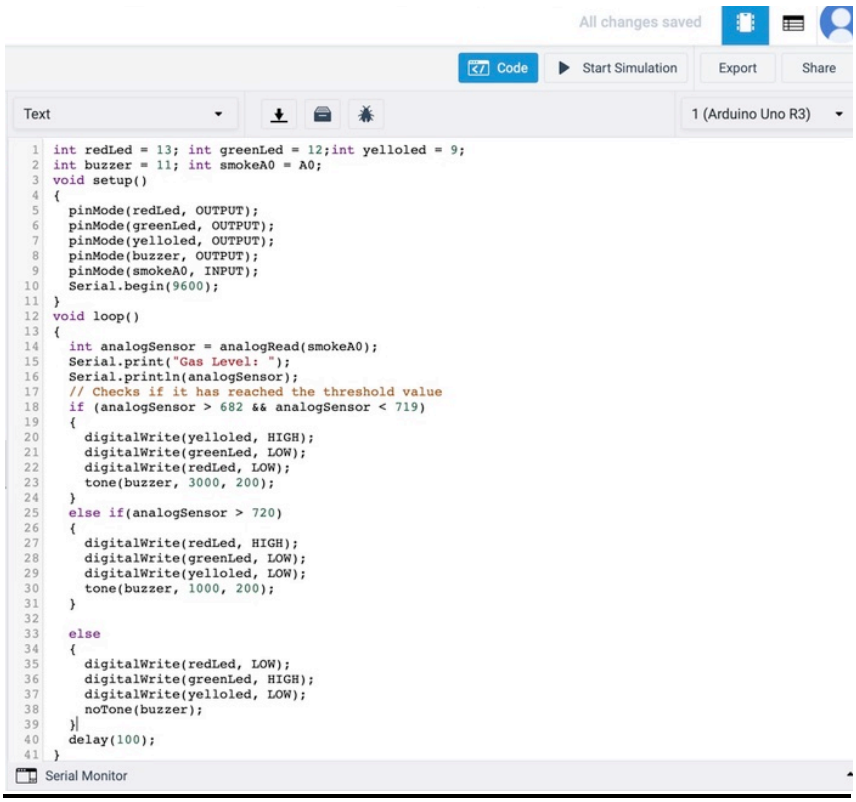
PIR Sensor activated
PIR Sensor activated
PIR Sensor activated
PIR Sensor activated

Week#8 Program Number:5

Implement a Tinkercad simulation for gas leakage detection with buzzer system using Arduino

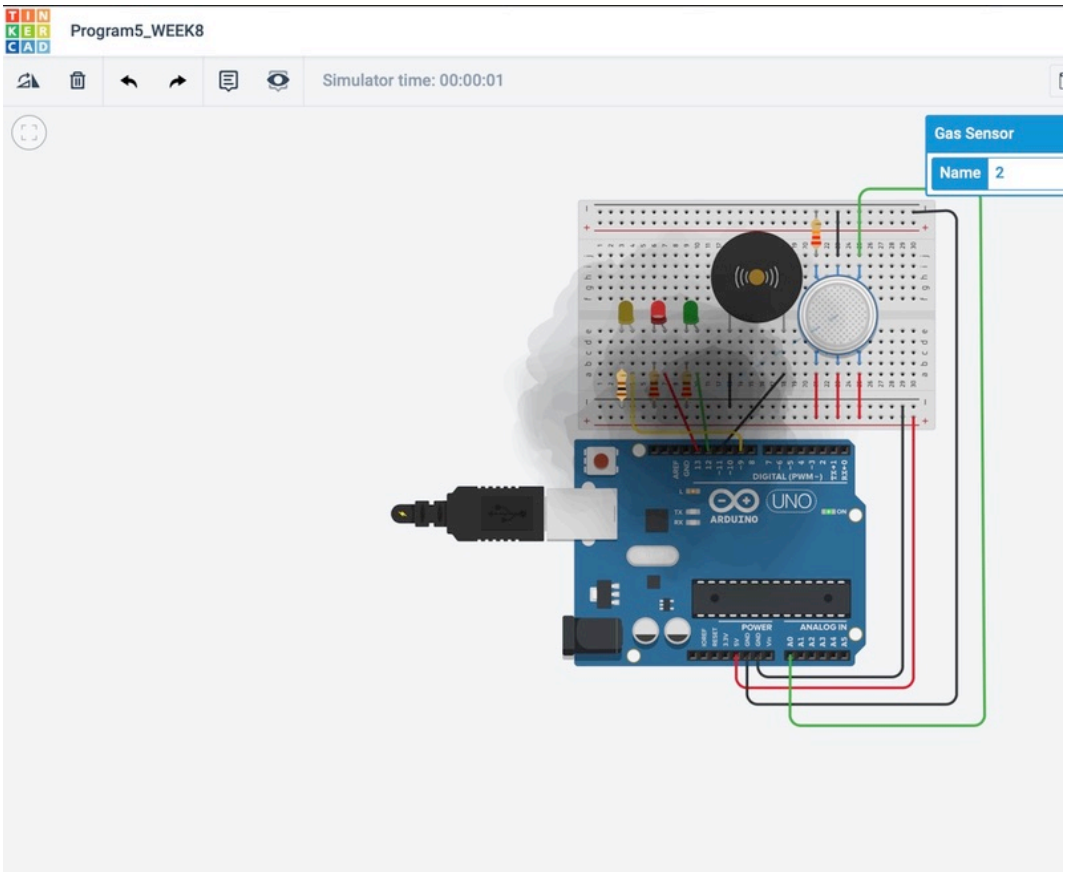
Arduino Code




```
int redLed = 13; int greenLed = 12;int yelloled = 9;
int buzzer = 11; int smokeA0 = A0;
void setup()
{
  pinMode(redLed, OUTPUT);
  pinMode(greenLed, OUTPUT);
  pinMode(yelloled, OUTPUT);
  pinMode(buzzer, OUTPUT);
  pinMode(smokeA0, INPUT);
  Serial.begin(9600);
}
void loop()
{
  int analogSensor = analogRead(smokeA0);
  Serial.print("Gas Level: ");
  Serial.println(analogSensor);
  // Checks if it has reached the threshold value
  if (analogSensor > 682 && analogSensor < 719)
  {
    digitalWrite(yelloled, HIGH);
    digitalWrite(greenLed, LOW);
    digitalWrite(redLed, LOW);
    tone(buzzer, 3000, 200);
  }
  else if(analogSensor > 720)
  {
    digitalWrite(redLed, HIGH);
    digitalWrite(greenLed, LOW);
    digitalWrite(yelloled, LOW);
    tone(buzzer, 1000, 200);
  }

  else
  {
    digitalWrite(redLed, LOW);
    digitalWrite(greenLed, HIGH);
    digitalWrite(yelloled, LOW);
    noTone(buzzer);
  }
  delay(100);
}
```

Output Screen Shot


Program5_WEEK8
Simulator time: 00:00:01
Gas Sensor
Name 2
UNO
ARDUINO
POWER
ANALOG IN


Serial Monitor
Gas Level: 776
Send
Clear

Disclaimer:

- The programs and output submitted is duly written, verified and executed by me.
- I have not copied from any of my peers nor from the external resource such as internet.
- If found plagiarized, I will abide with the disciplinary action of the University.

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