

IOT PROJECT

19 ECE 101

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Group: 5

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AIM:

To Develop an Algorithm and Program to detect the distance of the Obstacle using Ultra Sonic Distance Sensor and Alert the user.

Components Required:

- Arduino Board
- Bread Board
- Ultrasonic Sensor
- Potentiometer
- Resistors
- LED Lights (Red, Yellow)
- Piezo Buzzer
- LCD Screen (16 x 2)

Tool Used:

- Tinker Cad

Theory:

The accident-avoidance system helps to avoid the regular accidents that will normally occurring on highways and in city traffic.

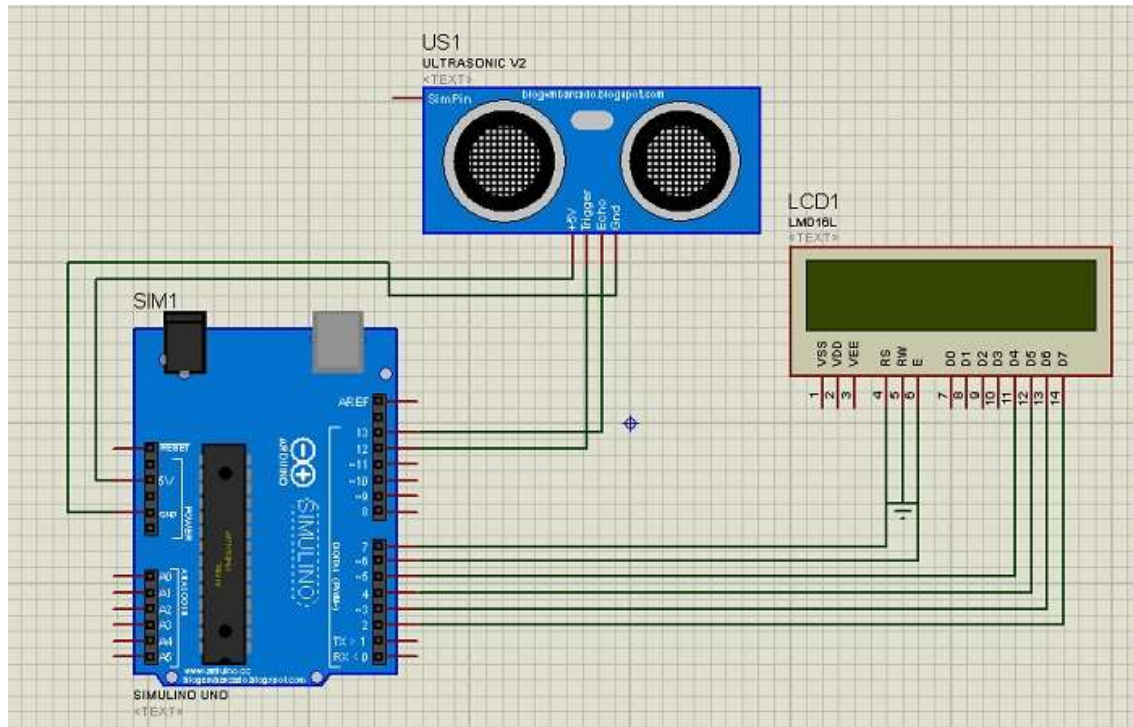
This is an Arduino-based collision detection warning system. This kind of system is the fastest growing safety feature in automotive industries. Such a system enables vehicles to identify

the chances of collision and give visual and audio warning to driver, so that the driver can take necessary action to avoid collision.

The basic idea behind this project is to avoid accidents. It is a precautionary measure that alerts the driver. The initial stage begins from the ultrasonic sensor that identifies the vehicle in the front and back side. At distance between 80 to 40 meters yellow colour light will alerts us. When it reaches 40meter distance red colour light will alerts us we are in danger zone. At the same time the distance between one vehicle and another vehicle was displayed in LCD. Wire connections are made from the bread board to the LCD. Aurdino kit to the ultrasonic sensors and finally bread board to the aurdino kit. This project will make easy calculation of a distance between one vehicle and another vehicle for the driver.



Circuit Diagram:



Program/Code:

```
#include<LiquidCrystal.h>
LiquidCrystal lcd(12,11,10,9,8,7);
const int trigPin = 4;
const int echoPin = 3;
int buzz = 5;
long duration;
int distance;
void setup() {
  lcd.begin(16,2);
  pinMode(trigPin, OUTPUT);
  pinMode(echoPin, INPUT);
  pinMode(13, OUTPUT);
```

```

pinMode(2, OUTPUT);
Serial.begin(9600);

}

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

  duration = pulseIn(echoPin, HIGH);
  distance= duration/59;

  if(distance>80){
    lcd.setCursor(0,0);
    lcd.print("You are safe!");
    lcd.setCursor(0,1);
    lcd.print("Dist. is ");
    lcd.print(distance);
    lcd.print("cm ");
    delay(100);
  }

  if(distance <= 80 && distance >= 40)
  {
    lcd.setCursor(0,0);
    lcd.print("Warning! ");
    lcd.setCursor(0,1);
    lcd.print("Dist. is ");
    lcd.print(distance);
    lcd.print("cm ");
    delay(100);
  }
}

```

```

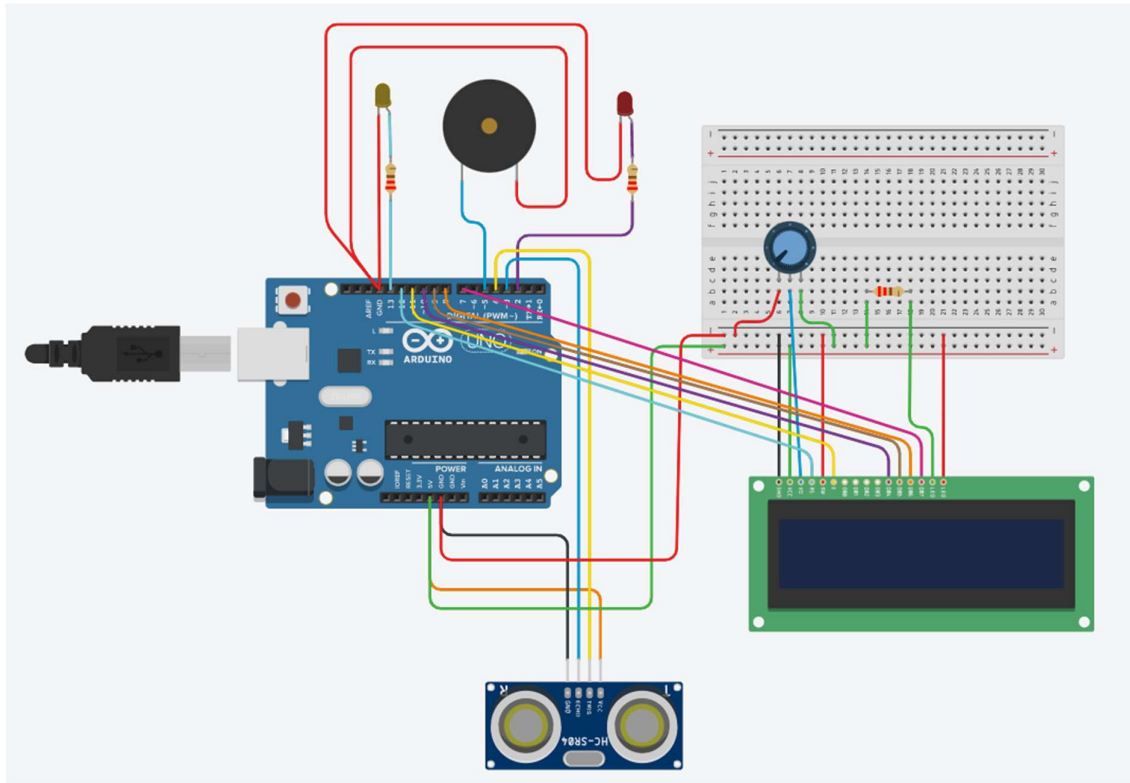
    digitalWrite(13, HIGH);
}

else
{
    digitalWrite(13, LOW);
}
if(distance <= 40)
{
    lcd.setCursor(0,0);
    lcd.print("Caution!   ");
    lcd.setCursor(0,1);
    lcd.print("Dist. is ");
    lcd.print(distance);
    lcd.print("cm ");
    delay(100);
    digitalWrite(2, HIGH);
    tone(buzz, 2000);
    delay(100);
    noTone(buzz);
    delay(50);
}

else
{
    digitalWrite(2, LOW);
}
}

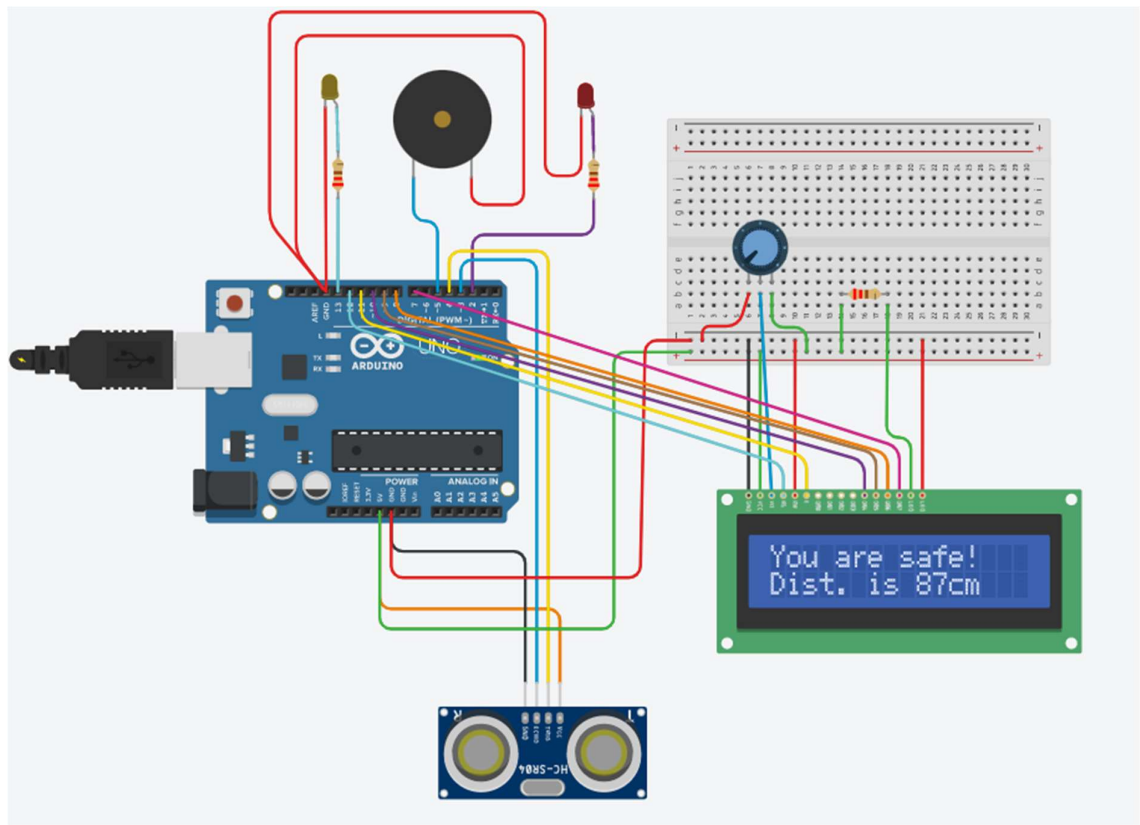
```

Circuit Diagram:

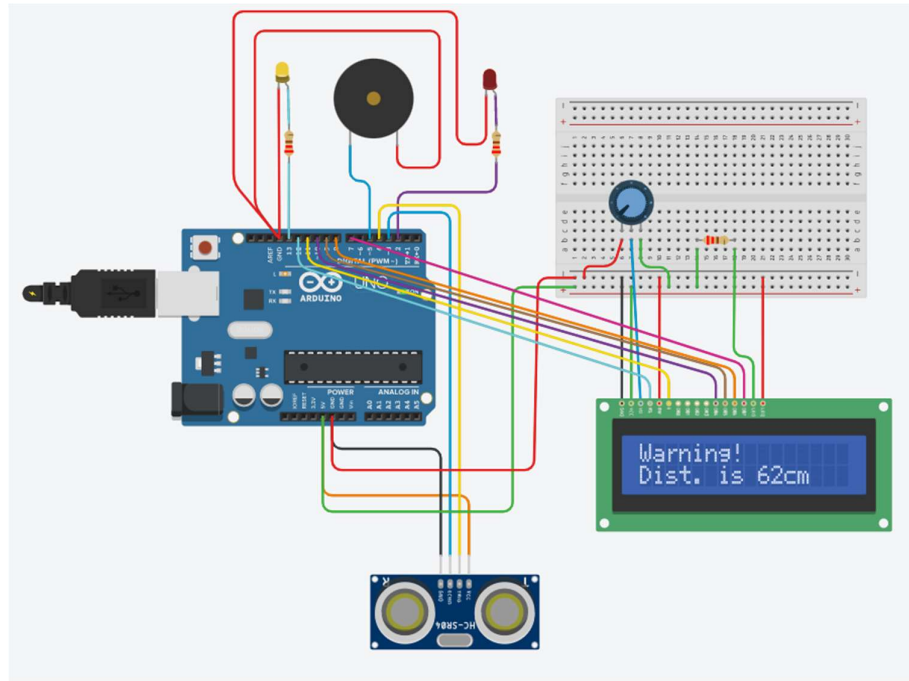


Snapshot of Output:

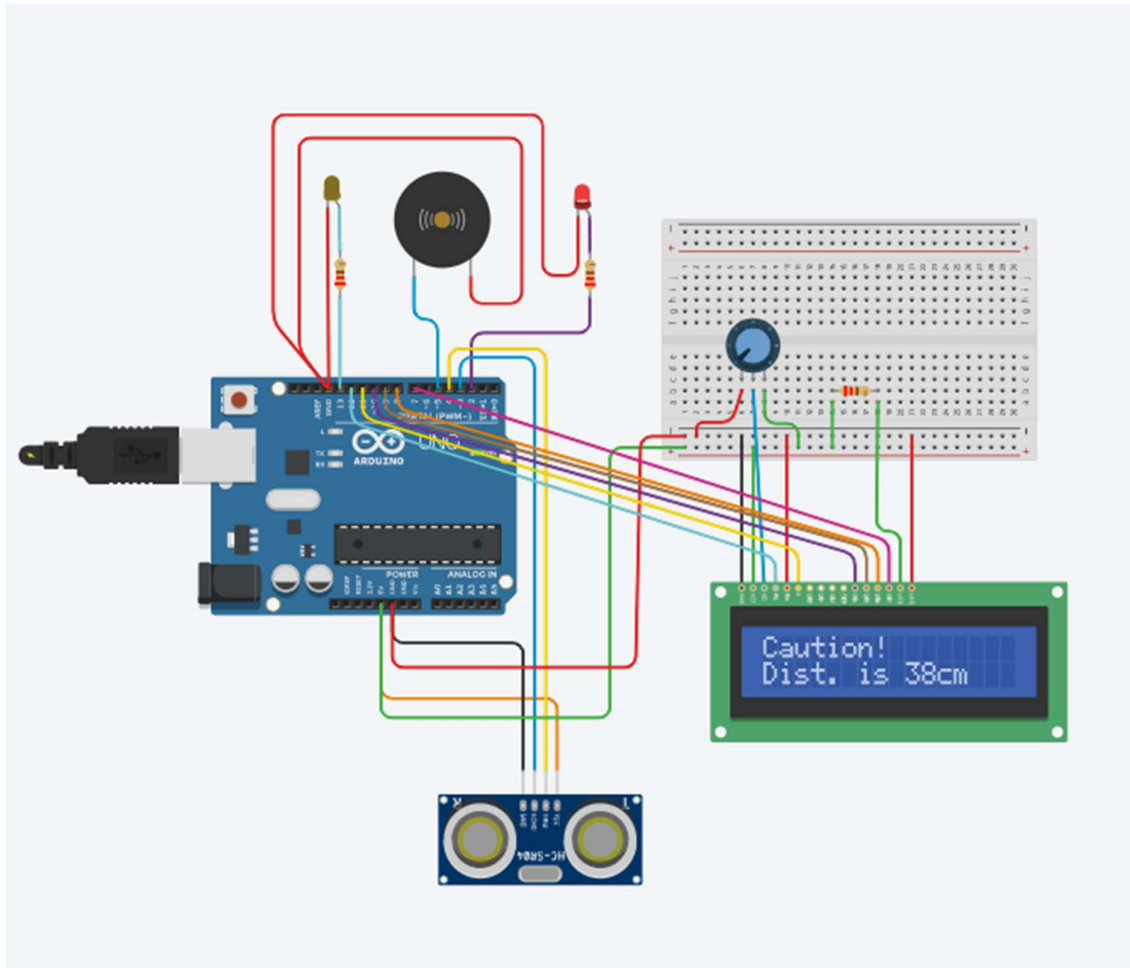
1. If the distance between Vehicle and Obstacle is greater than 80 meters: LCD prints "You are safe".



2. If the distance between Vehicle and Obstacle is between 40 to 80 meters: LCD prints "Warning "and yellow light blinks.



3. If the distance between Vehicle and Obstacle is Less than 40meters: Lcd prints “Caution”, red light blinks and buzzer makes sound.



Result:

This system is very useful for avoiding the accidents by alerting the driver. It contains 3 different zones:

Zone-1: When Obstacle is far away from vehicle.
'No Warning'

Zone-2: When Obstacle is Little Closer.

‘Only Visual Warning’

Zone-3: When Obstacle is Closer.

‘Both Visual and Audio Warning’

Conclusion:

Using this system, we may avoid many accidents happened due to the following system. The system comprises, very low-cost components such as ultrasonic sensor, LCD and LEDs. This system might have many advantages such as,

- Use the knows the distance about following vehicle
- In future, we are going to reduce the speed of one vehicle according to the following distance of another vehicle. By this system, we may prevent many accidents.