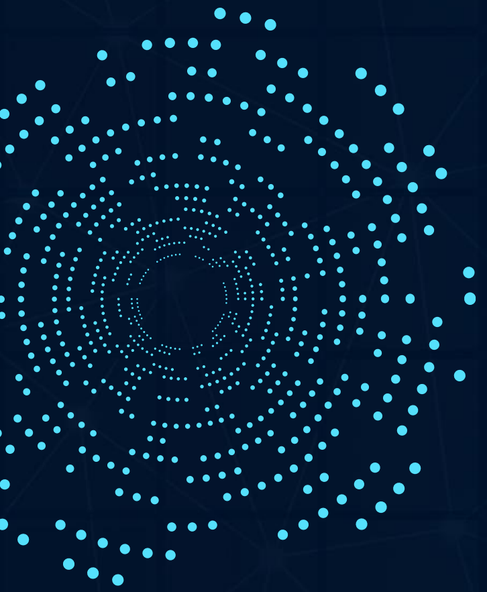
INTERNATIONAL ISLAMIC UNIVERSITY CHITTAGONG

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING



COURSE CODE: EEE-2422

ELECTRICAL DRIVES AND INSTRUMENTATION

COURSE INSTRUCTOR:

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SPEED TEST OF A MOVING OBJECT

PROJECT PRESENTATION

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GROUP 10

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INTRODUCTION

In this project, we will be testing the speed of a moving object. The speed of an object is defined as the distance traveled divided by the time taken to travel that distance. It is a measure of how fast an object is moving and is usually expressed in units of distance per time, such as meters per second or miles per hour.

Through this project, we hope to gain a better understanding of the factors that affect the speed of a moving object and how to accurately measure it.

LITERATURE REVIEW

Authors have studied various websites, articles, and reports about vehicle speed monitoring devices. These two are the best from those-

1. Kishorkumar C S, Chandrashekar K.V, Nikitha A, Monisha B &Impana Appaji in "Vehicle speed monitoring system using Arduino and speed sensor" developed a smart vehicle speed monitoring system is proposed using arduino and speed sensor. Considering the road safety a new technique is described to identify the speeding vehicle and charge them fine for breaking the rules or intimating the consulted authority to take action.

2. G. Kirankumar, J. Samsuresh, and G. Balaji, Member, ACET in "Vehicle Speed Monitoring System [VSM] (Using RuBee Protocol)" in 2012, have used smart card/board for detect high speed vehicle and Global Positioning System (GPS) used for tracking vehicle location.

WORKING PRINCIPLE

The working principle of a speed test of a moving car using an IR sensor and an Arduino involves using an infrared (IR) sensor to detect the presence and speed of a moving car, and an Arduino microcontroller to process the sensor data and display the speed on a display device.

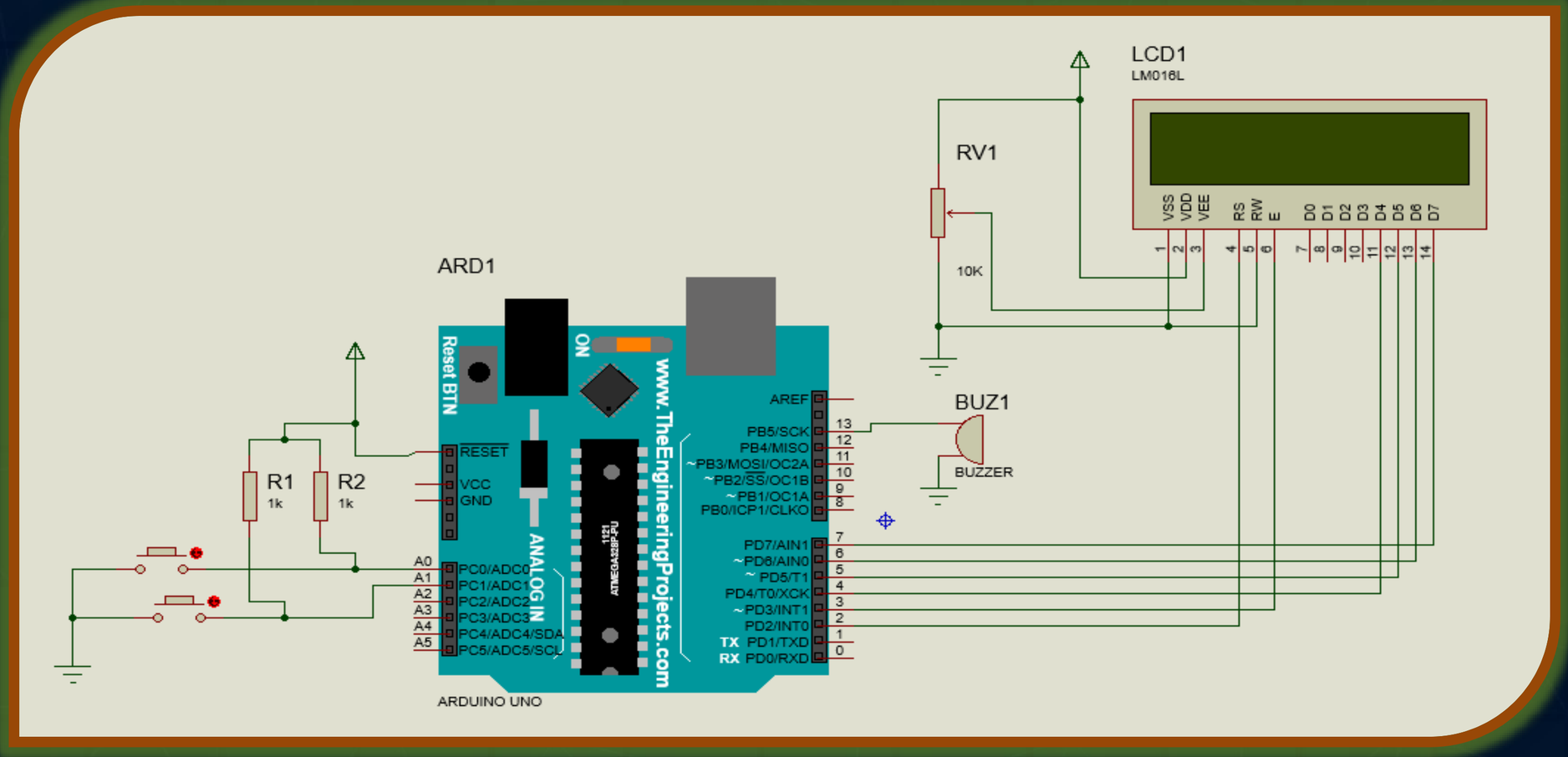
The Arduino microcontroller is programmed to receive the sensor data and calculate the speed of the car. It then displays the speed on a display device, such as an LCD screen, for the user to see.

This project can be used for a variety of purposes, including traffic enforcement, safety research, and performance testing. It is a useful tool for accurately measuring the speed of a moving car and providing real-time feedback to the user.

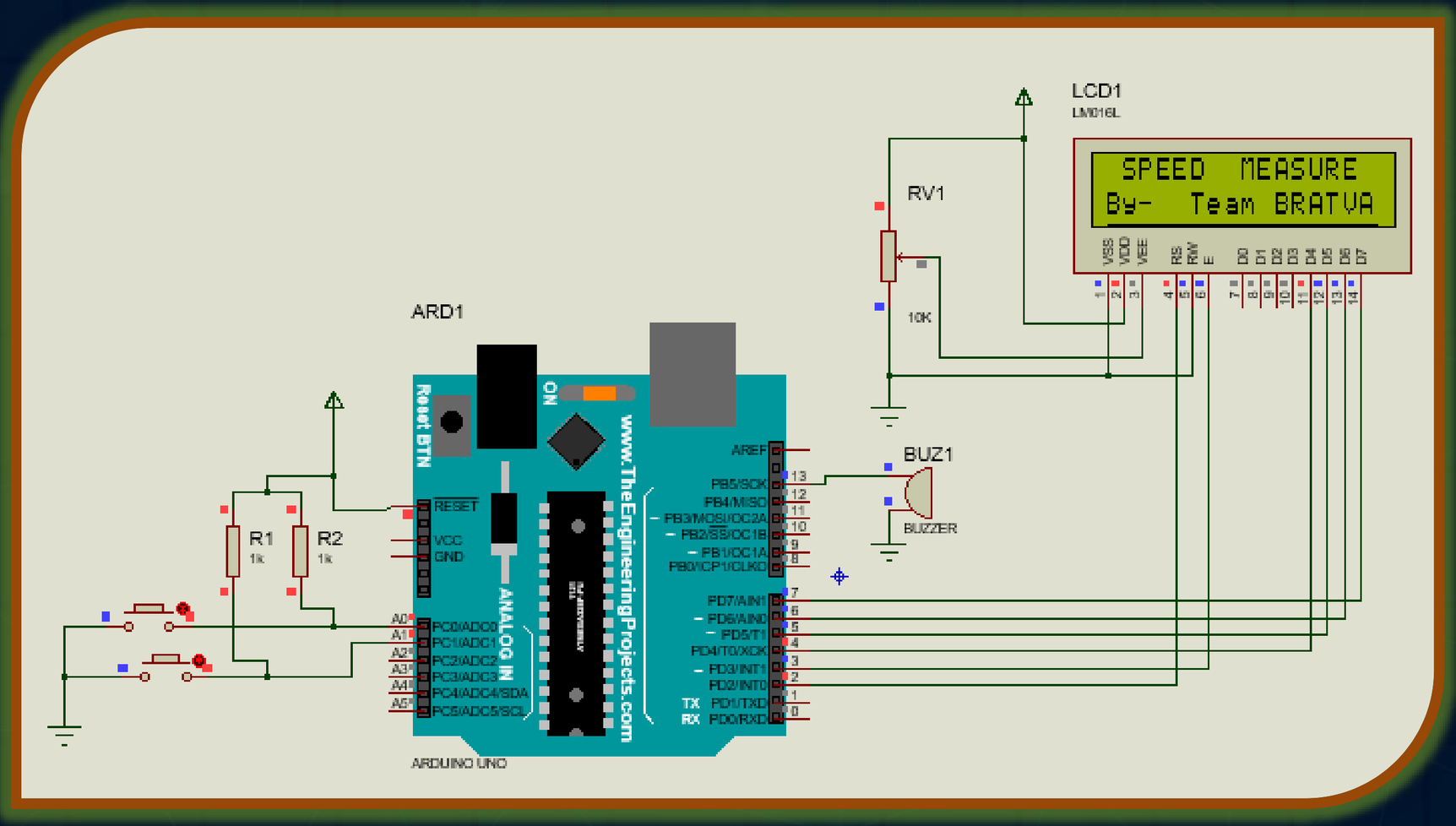
APPARATUS

- ✓ Arduino Uno R3 x 1'
- ✓ Standard LCD Display- 16x2 White on Blue x 1
- ✓ **IR Sensor x 2**
- ✓ LED (Red, Green) x 2
- ✓ Resistor 100-ohm x 2
- ✓ Single Turn Potentiometer- 10k ohms x 1
- ✓ Buzzer x 1
- ✓ Button (Re-Check) x 1
- ✓ Some Connecting Wire

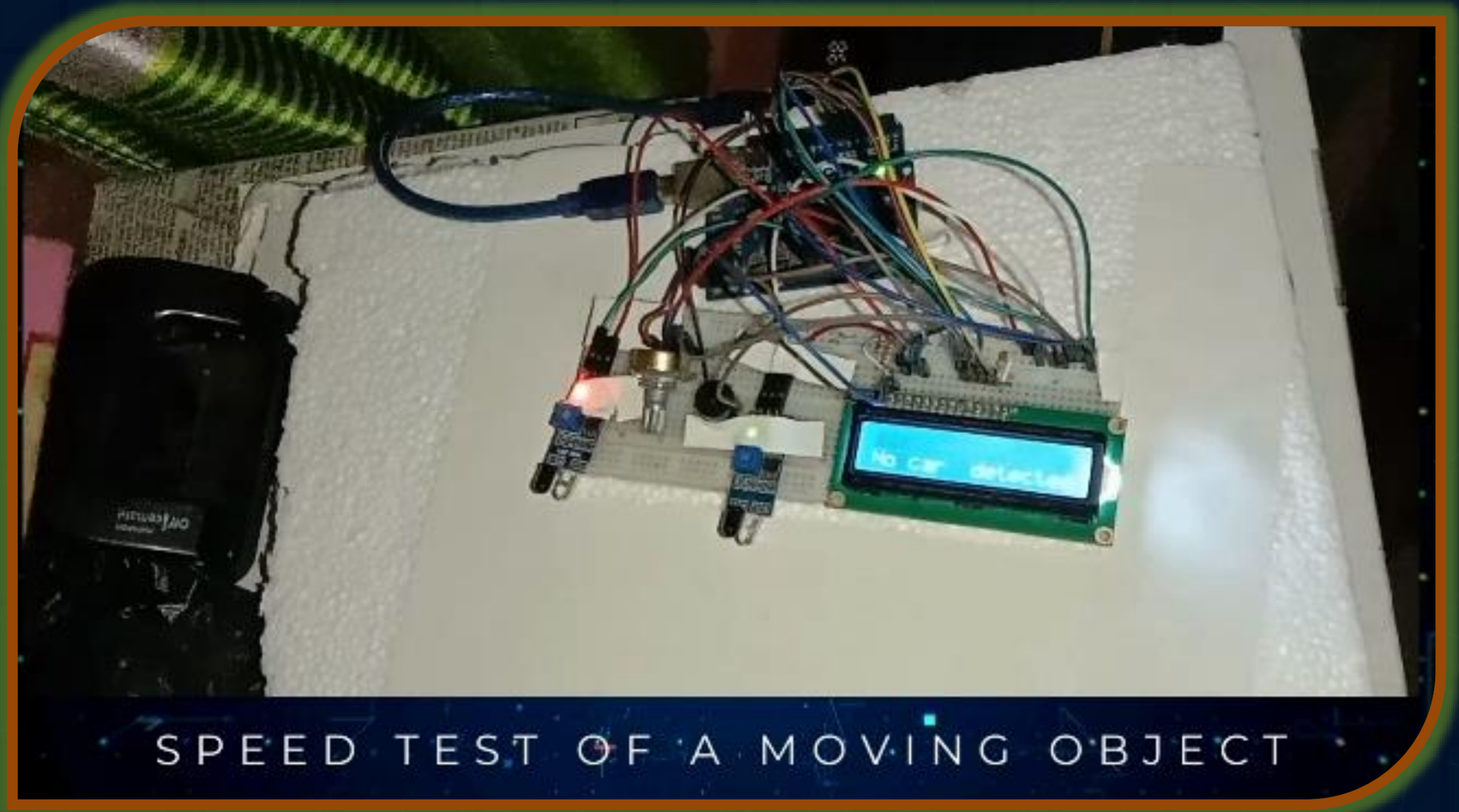
CIRCUIT DIAGRAM



SIMULATION RESULT

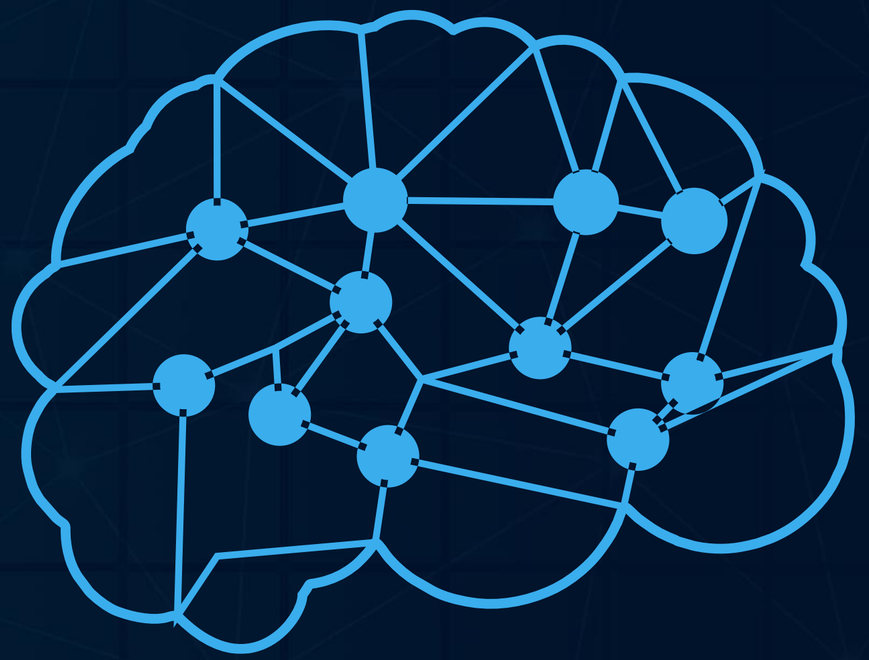


HARDWARE IMPLEMENTATION



APPLICATION

- One application of the speed test of a moving car using an IR sensor and an Arduino is traffic enforcement. The device can be mounted on the side of a road and used to measure the speed of passing vehicles.
- Another application is safety research. The device can be used to measure the speed of vehicles at different locations.
- The device can also be used for performance testing. For example, it could be used to measure the speed of a race car on a track.



Overall, the speed test of a moving car using an IR sensor and an Arduino has a wide range of potential applications in fields such as traffic enforcement, safety research, and performance testing.

ADVANTAGES

- ❖ Accurate measurement
- ❖ Real-time feedback
- ❖ Versatility
- ❖ Low cost
- ❖ Alarm System
- ❖ Display instantly

DRAWBACKS

- ❖ Limited range
- ❖ Sensitive to weather conditions
- ❖ Requires programming
- ❖ Limited to measuring speed
- ❖ Can’t recognize multiple object
- ❖ Object means only Car

FUTURE SCOPE

- Image detection system can be applied
- System can be connected & maintained under a server.
- Can send alert message to drivers who often breaks speed limit.

COST ANALYSIS

Arduino Uno R3 x 1	-650 TK
Standard LCD Display - 16x2 White on Blue x 1	-120 TK
Ultrasonic Sensor - HC-SR04 (Generic) x 1	- 90 TK
LED (Red, Green) x 2	- 10 TK
Resistor 100-ohm x 2	- 5 TK
Single Turn Potentiometer- 10k ohms x 1	- 30 TK
Buzzer x 1	- 30 TK

Here, Our Total Cost Is BDT 1000 TK.

CONCLUSION

The system can be easily customized and adapted to a wide range of conditions, making it a flexible and versatile tool for measuring the speed of moving vehicles. Overall, the "speed test of a moving car using IR sensor and Arduino" project represents a valuable contribution to the field of vehicle speed measurement, and has the potential to be used in a variety of applications where accurate and reliable speed measurements are required.

CODING

```
#include<LiquidCrystal.h>
//LiquidCrystal lcd(rs, en, d4, d5,
d6, d7);
LiquidCrystal lcd(2, 3, 4, 5, 6,
7);

int timer1;
int timer2;

float Time;

int flag1 = 0;
int flag2 = 0;

float distance = 5.0;
float speed;

int ir_s1 = A0;
int ir_s2 = A1;

int buzzer = 13;

void setup() {
  pinMode(ir_s1, INPUT);
  pinMode(ir_s2, INPUT);
  pinMode(buzzer, OUTPUT);

  lcd.begin(16, 2);
  lcd.clear();
  lcd.setCursor(0, 0);

  lcd.print(" SPEED  MEASURE ");
  lcd.setCursor(0, 1);

  lcd.print("By-  Team BRATVA");
  delay(2000);
  lcd.clear();
}

void loop() {
  if (digitalRead (ir_s1) == LOW &&
flag1 == 0) {
    timer1 = millis();
    flag1 = 1;
  }

  if (digitalRead (ir_s2) == LOW &&
flag2 == 0) {
    timer2 = millis();
    flag2 = 1;
  }

  if (flag1 == 1 && flag2 == 1) {
    if (timer1 > timer2) {
      Time = timer1 - timer2;
    }
    else if (timer2 > timer1) {
      Time = timer2 - timer1;
    }
    Time = Time / 1000; //convert
millisecond to second
    speed = (distance / Time);
//v=d/t
    speed = speed * 3600;
//multiply by seconds per hr
    speed = speed / 1000;
//division by meters per Km
  }

  if (speed == 0) {
    //lcd.clear(); // NEW 1
    lcd.setCursor(0, 1);
    if (flag1 == 0 && flag2 == 0) {
      lcd.print("No car
detected");
      //delay(2000); // NEW 2
    }
    else {
      lcd.print("Searching...
");
    }
  }
  else {
    lcd.clear();
    lcd.setCursor(0, 0);
    lcd.print("Speed:");
    lcd.print(speed, 1);
    lcd.print("Km/Hr  ");
    //delay(3000);
    lcd.setCursor(0, 1);
    if (speed > 50) {
      lcd.print("  Over Speeding
");
      digitalWrite(buzzer, HIGH);
      //tone(buzzer, 3000, 200);
    }
    else {
      lcd.print("  Normal Speed
");
    }
    delay(3000);
    digitalWrite(buzzer, LOW);
    //tone(buzzer, 3000, 400);
    lcd.clear();
    speed = 0;
    flag1 = 0;
    flag2 = 0;
  }
}
```

HAVE ANY QUESTION?

THE END

THANKS

Assalamu ‘alaikum wa-rahmatullahi wa-barakatuhu.