Automatic Speed Detection & Reporting System Using Arduino

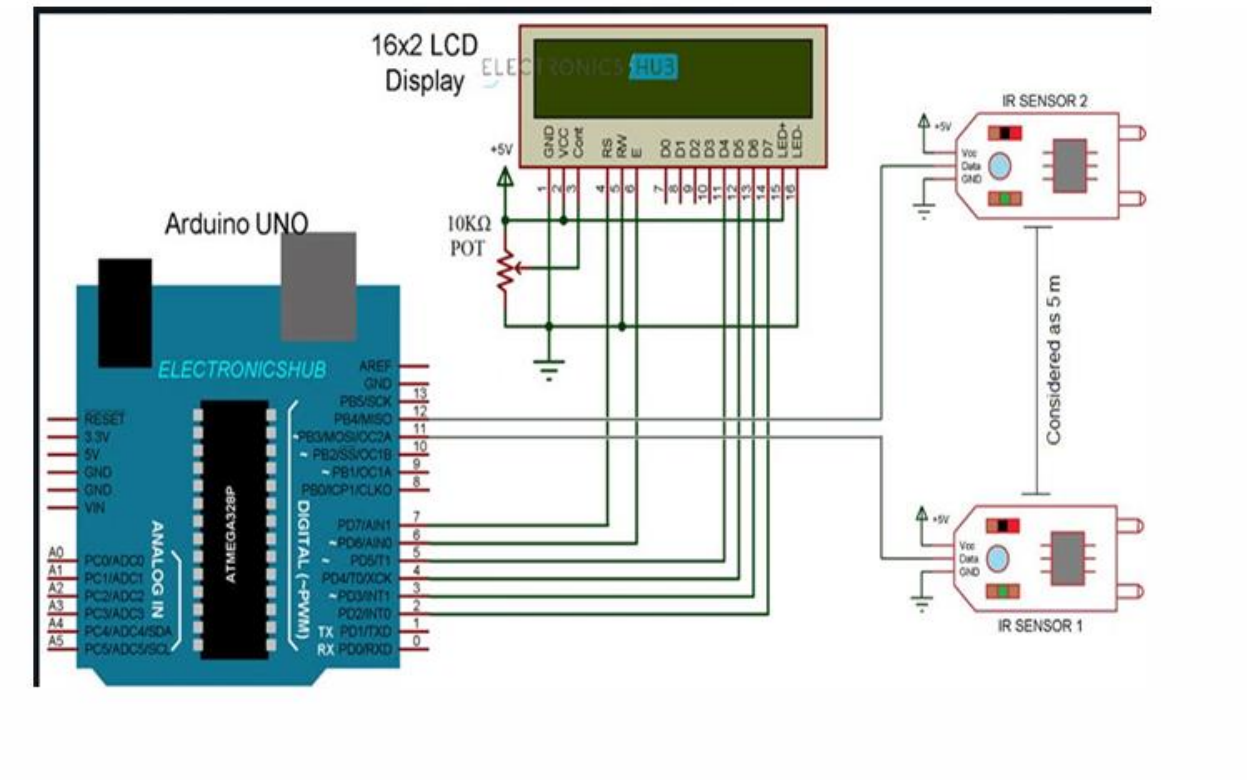
Objective:

To design and implement a low-cost Arduino-based system that can automatically detect the speed of a moving vehicle using IR sensors and alert users if the speed exceeds a set limit. The system aims to enhance road safety and enable intelligent speed monitoring.

Hardware used:

S. No.	Component Name	Quantity
1	Arduino Uno	1
2	IR Sensor Modules	2
3	Buzzer	1
4	16x2 LCD Display	1
5	Breadboard	1
6	Jumper Wires	15–20
7	Resistors (220Ω, 10kΩ)	As required
8	USB Cable / Power Supply	1
9	LED (Optional Indicator)	1

Circuit Diagram:



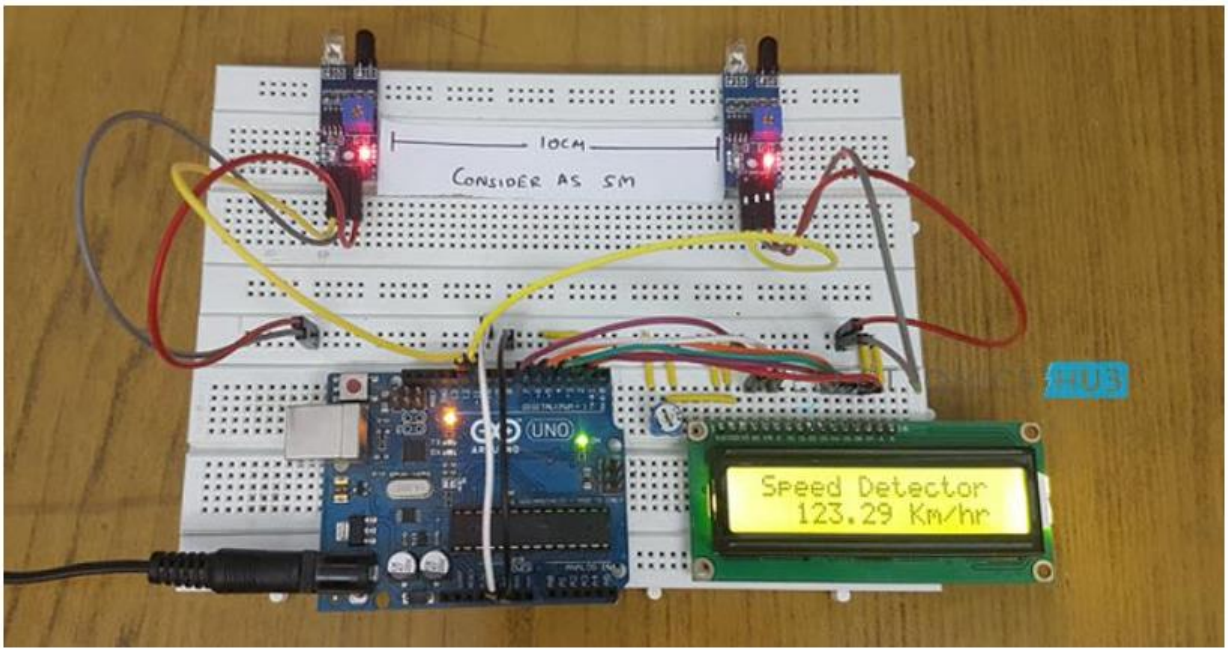
Working principle:

- Two IR sensors are placed a fixed distance apart (e.g., 7.5 cm).
- When a vehicle crosses the first sensor, a timer starts.
- When the second sensor is triggered, the timer stops.
- Using the known distance and elapsed time, speed is calculated using:

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}} \rightarrow \text{converted to km/hr}$$

- The speed is displayed on an LCD.
- If the speed exceeds a preset threshold, a **buzzer is triggered** to alert the user.

Hardware/testing:



Conclusion:

The existing model presents an Integrating feature of all the hardware components which has been used and developed in it with Arduino. The Presence of each and every module has been reasoned out and placed very carefully. Hence the contributing to the best working unit for "Vehicle speed detection using Arduino and IR sensors" has been designed perfectly. The device provides an automated solution to continuously monitor the vehicle speed and display the vehicle speed on LCD module and the system able to give the over speed alerts through buzzer. Thus, the project has been successfully designed and tested. By using this project, we can reduce the road accidents. In future, this system can be extended by integrating a camera which could capture the image of the number plate of the vehicle and sends to the traffic authorities or the corresponding vehicle owner.