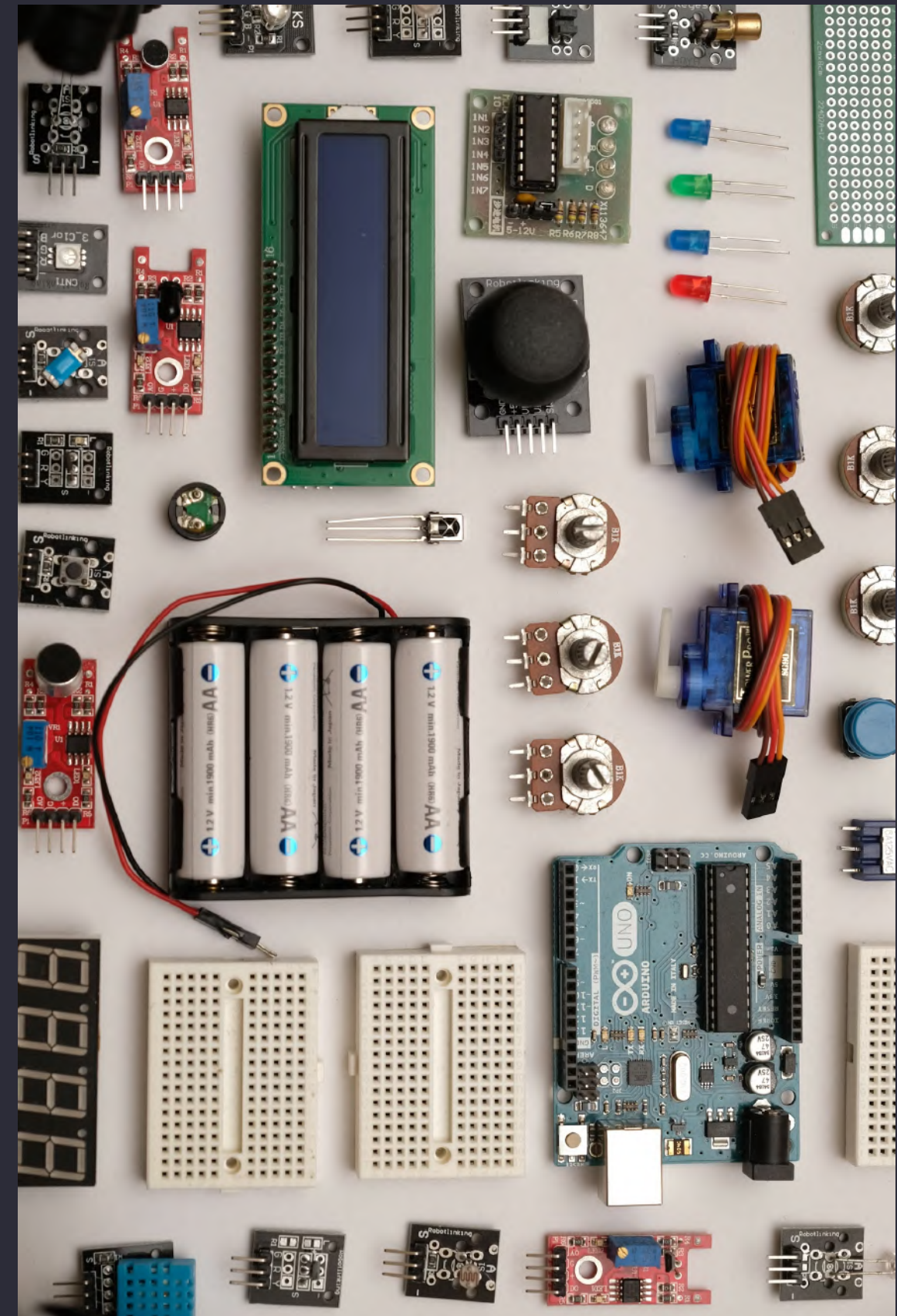
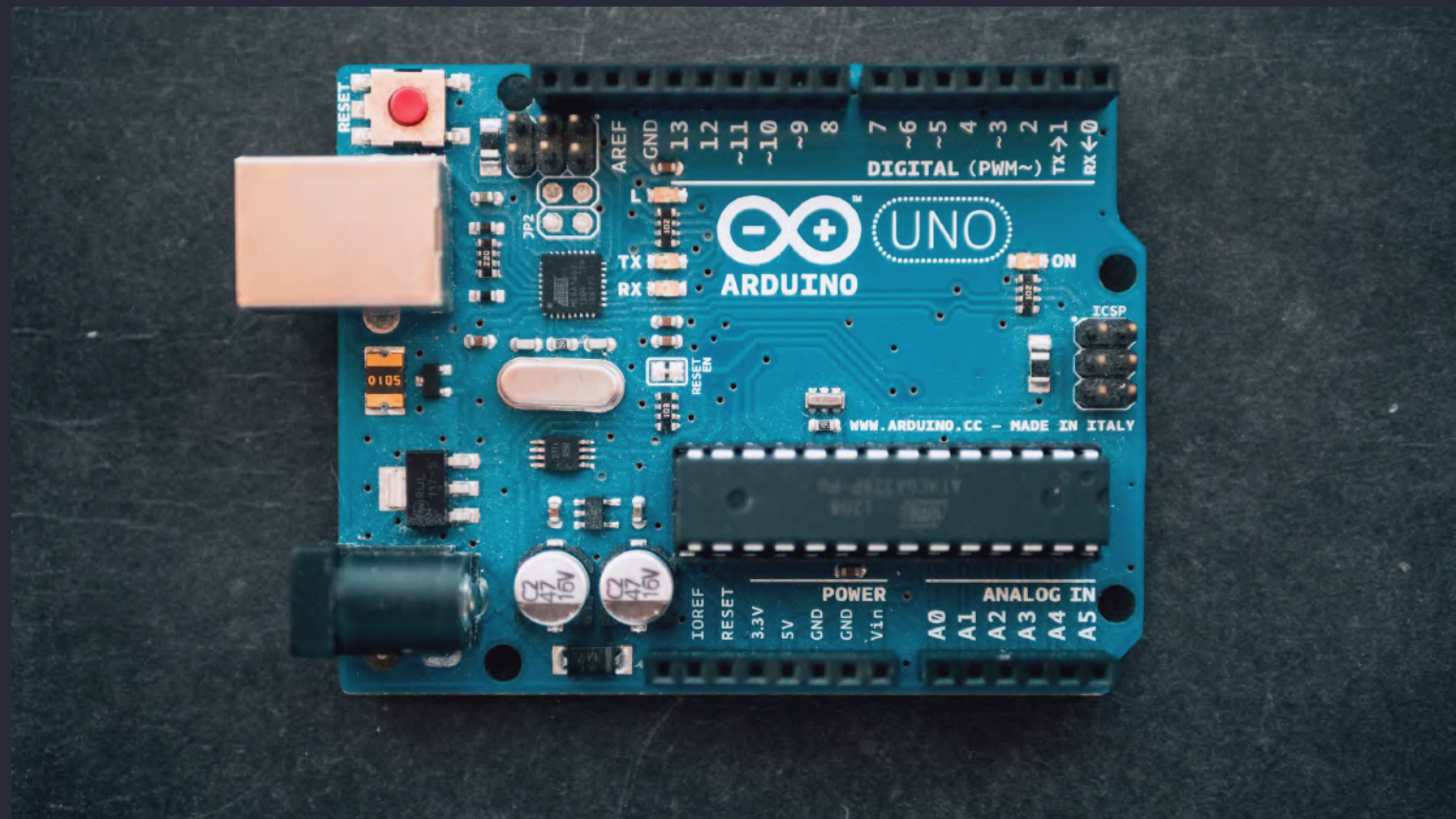


By: Amaan A



Components in the Presentation



- Introduction
- Parts Used
- Flow Chart
- Project Demonstration
- The Output Data
- Conclusion
- References

Introduction

The technology has witnessed a vast growth in the last years in the sector of smart parking solutions in automobiles. All the sensors used in such parking systems have their unique uses and are used for crash prevention and avoidance in these vehicles. It saves a lot of physical damage from happening in vehicles and is widely used in modern cars and even some of the bikes in first world countries. In our project, we have created a working model of a car which detects if the rear side is about to hit the wall or an object in its path and gives the signal in the form of LED blinking, Buzzer sound and LCD output to prevent the car from being hit.

In this presentation, we are going to describe the working of a car after implementing an Ultrasonic sensor, functioning of Ultrasonic sensor, Buzzer, LCD, Arduino Uno and all other minor components.

The primary aim of this project is to increase the safety and efficiency of the car by using modern technology and sensors. We will be discussing the overall implementation of the sensor, the system around it and overall functioning and the performance of our vehicle.

Arduino Uno

It is one of the most commonly used boards in the Arduino family and is designed for beginners. The board has 14 digital input/output pins, 6 analog inputs, a 16 MHz quartz crystal, a USB connection, a power jack, an header, and a reset button.



Ultrasonic Sensor

The ultrasonic sensor is a non-contact type of sensor used to measure an object's distance and velocity. This sensor operates on sound wave property to measure the velocity and distance of the object.



16x2 LCD

The LCD (Liquid Crystal Display) is a type of display that uses the liquid crystals for its operation. Here, we will accept the serial input from the computer and upload the sketch to the Arduino. The characters will be displayed on the LCD.



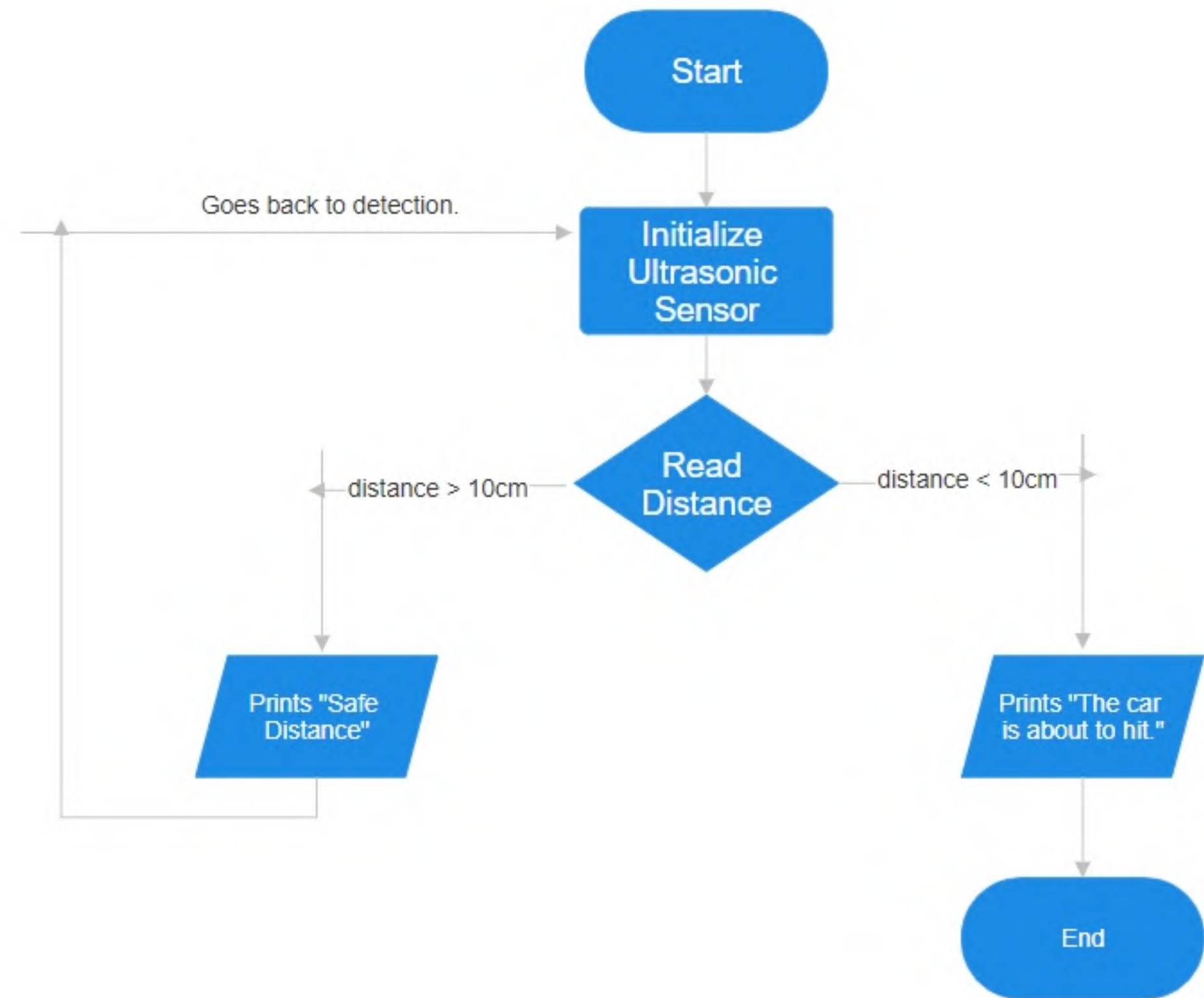
Buzzer

A buzzer or beeper is an audio signaling device, which may be mechanical, electromechanical. Typical uses of buzzers and beepers include alarm devices, timers, train and confirmation of user input such as a mouse click or keystroke.



Flowchart of the Project

The following is the functioning overview of the project visualised and represented in the algorithm flowchart.



WORKING PROJECT DEMONSTRATION

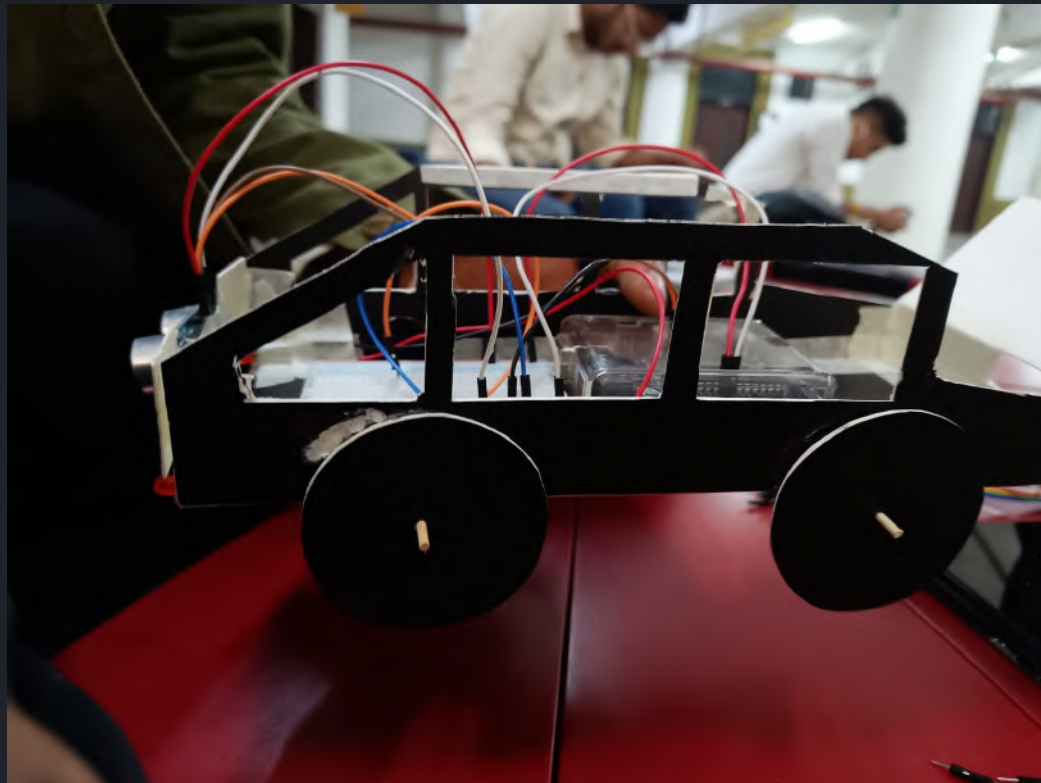


Figure 1

Working body and prototype of the project entirely made with a cardboard.

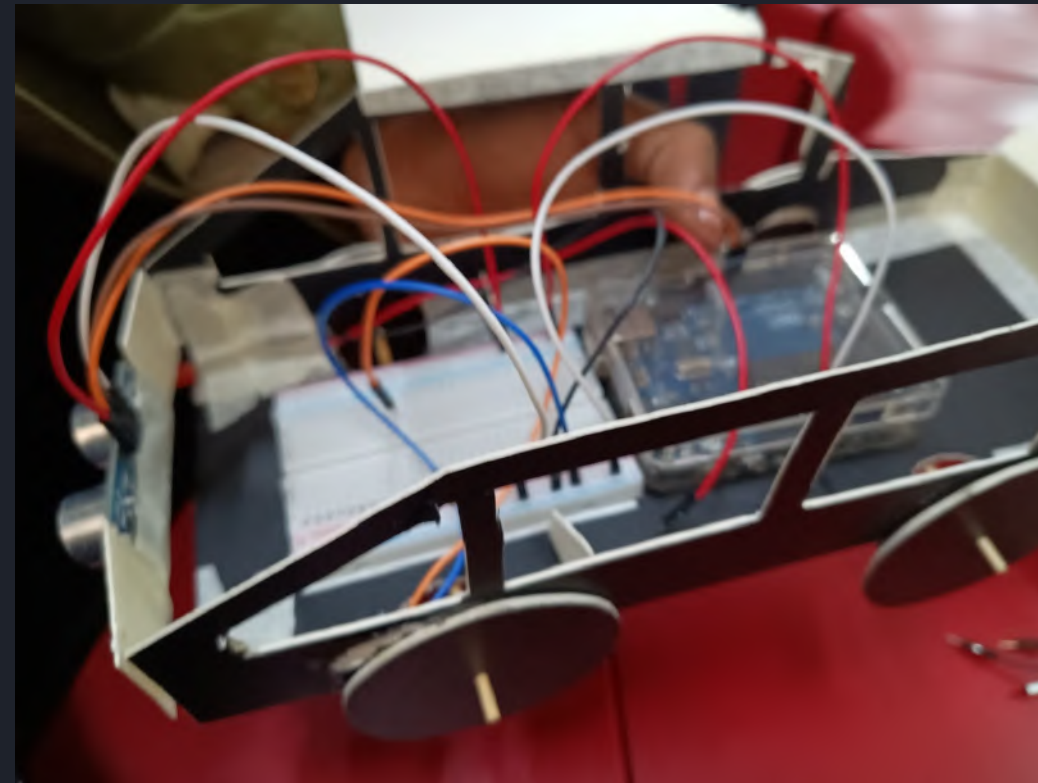


Figure 2

Look at the circuits and wiring of the project along with all the parts used in the project.

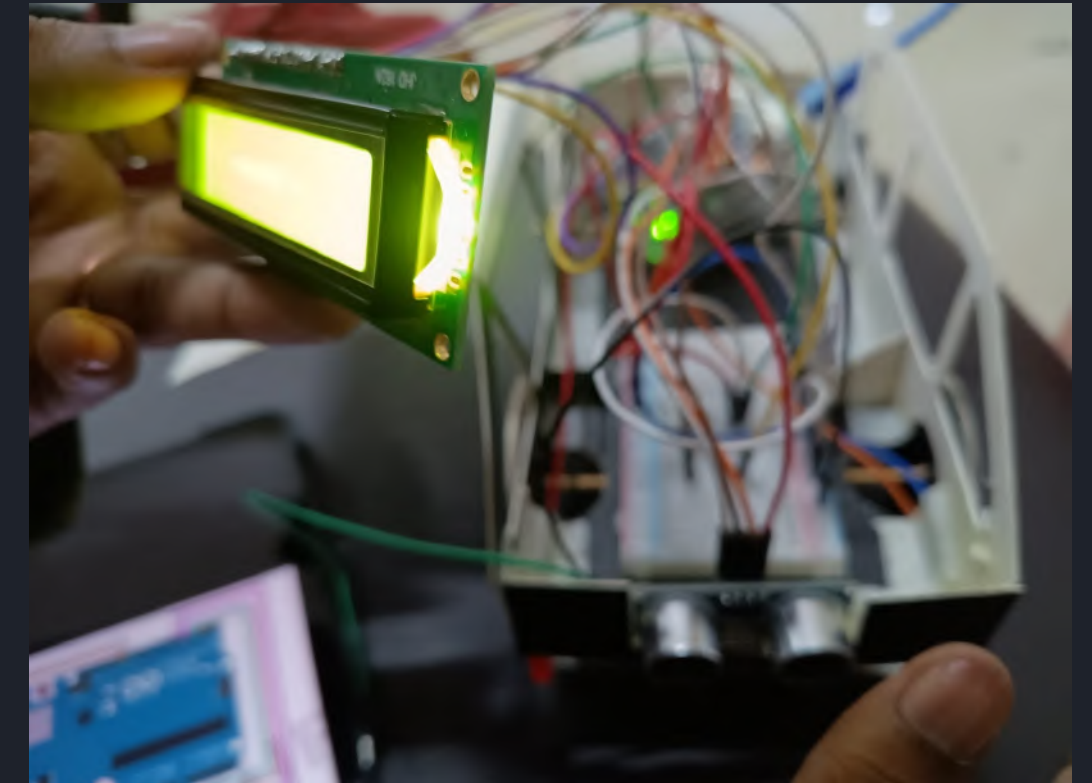


Figure 3

Output in the LCD in the working scenario when the required condition is met as mentioned in the Arduino code.

The Output & Data

```
68 cm
Safe distance
68 cm
Safe distance
14 cm
3, 2 Safe distance
69 cm
Safe distance
20 cm
Safe distance
22 cm
Safe distance
23 cm
You are about to hit the rear!
4 cm
```

```
29 cm
Safe distance
1008 cm
Safe distance
28 cm
2 Safe distance
11 cm
Safe distance
1012 cm
Safe distance
108 cm
Safe distance
1012 cm
You are about to hit the r
9 cm
```

This is the result or the output displayed in the terminal when the distance in the rear end of the car is more than 10 cm as detected by the Ultrasonic sensor before the car is about to hit any obstacle or wall and displays the message, "Safe distance".

The Output & Data

```
10 cm
5 cm
2 You are about to hit the rear!
6 cm
You are about to hit the rear!
7 cm
You are about to hit the rear!
5 cm
You are about to hit the rear!
5 cm
You are about to hit the rear!
9 cm
```

☒ Autoscroll ☐ Show timestamp

```
5 cm
You are about to hit the rear!
6 cm
You are about to hit the rear!
7 cm
2 You are about to hit the rear!
5 cm
You are about to hit the rear!
5 cm
You are about to hit the rear!
9 cm
You are about to hit the rear!
4 cm
You are about to hit the rear!
```

This is the result or the output displayed in the terminal when the distance in the rear end of the car is less than or equal to 10 cm as detected by the Ultrasonic sensor when the car is about to hit the obstacle or the wall and displays the message to, "You are about to hit the car".

Conclusion

The future of cars with sensors that can detect objects in their path and automatically display if the object is about to hit the car is fascinating. As technology continues to grow, we are going to see more and more advancement in this area of safety and security. It makes the entire approach to automobile safety more secure, efficient and convenient. Additionally, the development of autonomous vehicles that can use sensors to identify effectively and safely has the potential to evolve the automobile industry beyond our reckoning and remove all the accidents that can be caused by human error. Ultimately the use of sensors in cars has the potential to save lives and improve mobility for people around the world. This project was extremely helpful when it comes to understading the need of the modern automobile industry and how the security features are implemented.



References

- Smart Parking System using IoT by Mr. Pavan Kumar (Proceedings of the 7th International Conference on I-SMAC (IoT in Social, Mobile, Analytics and Cloud) (I-SMAC 2023) IEEE Xplore Part Number: CFP23OSV-ART; ISBN: 979-8-3503-4148-5)
- <https://www.youtube.com/watch?v=JTL3vzvTZac>
- <https://www.youtube.com/watch?v=3vwmys7y1QE>
- <https://www.youtube.com/watch?v=qUo6hXSV1b8>



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