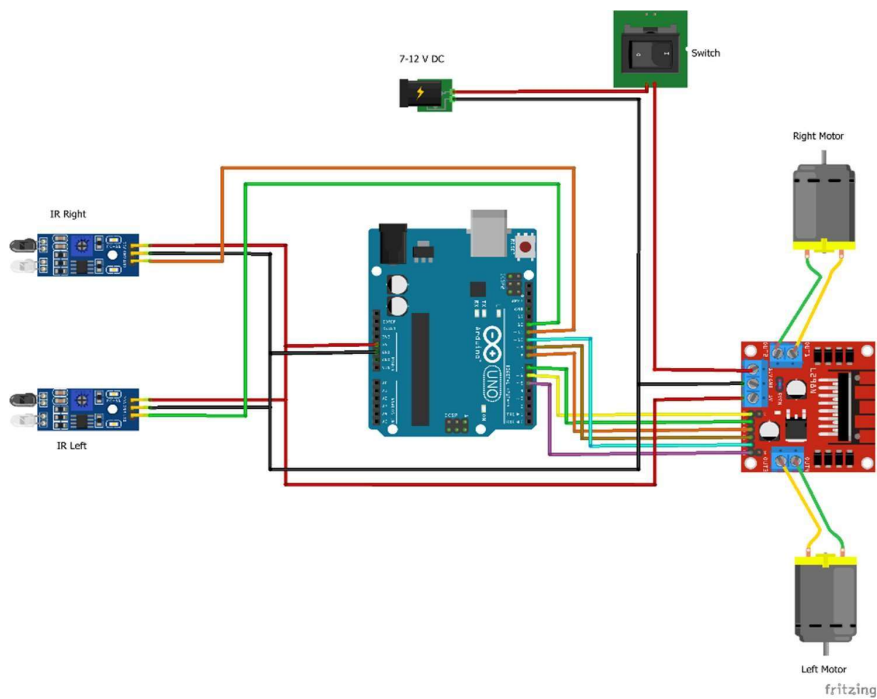# 1.Line Following Robot

I.Goal:

The goal of this project is to autonomously follow a designated line path with precision and stability.

II. Material Required:

1. Arduino Uno-1   5. Lithium-ion Batteries- 2

2. L298N Module-1   6. Several Jumper Wires

3. USB Cable-1   7. IR Sensor-2

4. Battery Holder-1   8. 2WD Car Kit-1

III. Wiring Diagram:

L298N	Battery Holder
12V	Red Wire
GND	Black Wire

Connection of Arduino uno to L298N Driver

L298N Module	Arduino Uno
EN A	6
Pin 1	7
Pin 2	8
Pin 3	9
Pin 4	10
EN B	5

Assembling point

1. connect the wire EN A in L298N to Arduino pin 6.

2. connect the wire EN B in L298N to Arduino pin 5.

3. connect the wire Pin 1 in L298N to Arduino pin 7.

4. connect the wire Pin 2 in L298N to Arduino pin 8.

5. connect the wire Pin 3 in L298N to Arduino pin 9.

6. connect the wire Pin 4 in L298N to Arduino pin 10.

IR Sensor

Right sensor

1. Connect Out pin in IR Sensor to Arduino pin 11.

2. Connect GND pin in IR Sensor to Arduino pin GND

3. Connect VCC pin in IR Sensor to Arduino pin +5V

Left Sensor

1. Connect Out pin in IR Sensor to Arduino pin 12.

2. Connect GND pin in IR Sensor to Arduino pin GND

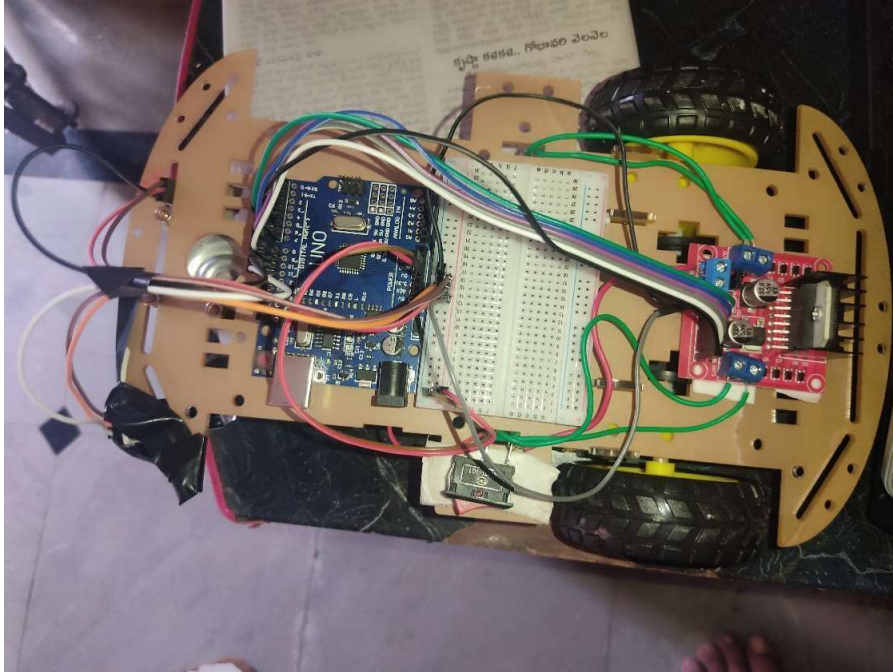3. Connect VCC pin in IR Sensor to Arduino pin +5V

Battery Holder

1. Connect the Positive wire (Red) to +5V in L298N Module.

2. Connect the Negative wire (Black) to GND in L298N Module.

IR Sensor Connection

RIGHT SENSOR	
IR Sensor	Arduino Uno
OUT	11
GND	GND
VCC	+5V

LEFT SENSOR	
IR Sensor	Arduino Uno
OUT	12
GND	GND
VCC	+5V

Working Diagram

IV. Output:

The robot can be controlled to move in any direction with the help of the drawn the path on a white-coloured surface with black colour tape.

V. Troubleshooting points:

1. Sensor Calibration: Ensure sensors are correctly calibrated to detect the line's colour and contrast.

2. Surface Conditions: Check the surface for irregularities, dirt, or glare that may affect line detection.

3. Speed Settings: Adjust the robot's speed; too fast may cause it to lose the line, while too slow may cause it to oscillate.

4. Power Supply: Verify that the batteries are charged and connections are secure to ensure proper operation.

5. Alignment of Sensors: Confirm that the sensors are aligned correctly and positioned at the right height above the surface.

6. Algorithm Tuning: Review and adjust the line-following algorithm parameters for optimal performance.