



Project Title

IOT / Line-follower Robot

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2. Engineer's name

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3. Names of the team

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4. summary

The Line Follower Robot is a hardware project that follows a predefined line using IR sensors. The sensors detect the line position and send data to an Arduino microcontroller, which controls the motors through a motor driver to move the robot forward, left, right, or stop automatically.



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5. Project code

```
#define speedL 10
#define IN1 9
#define IN2 8
#define IN3 7
#define IN4 6
#define speedR 5
#define sensorL 4
#define sensorR 3

int sl=0;
int sr=0;

void setup() {
    for(int i=5;i<=10;i++)
    {
        pinMode(i, OUTPUT);
    }
    pinMode(sensorR, INPUT);
    pinMode(sensorL, INPUT);}
}

void forward()
{
    digitalWrite(IN1, HIGH);
    digitalWrite(IN2, LOW);}
```

```
digitalWrite(IN3, HIGH);
digitalWrite(IN4, LOW);
analogWrite(speedL, 150);
analogWrite(speedR, 150);

}

void backword(){
digitalWrite(IN1, LOW);
digitalWrite(IN2, HIGH);
digitalWrite(IN3, LOW);
digitalWrite(IN4, HIGH);
analogWrite(speedL, 150);
analogWrite(speedR, 150);

}

void left(){
digitalWrite(IN1, LOW);
digitalWrite(IN2, LOW);
digitalWrite(IN3, HIGH);
digitalWrite(IN4, LOW);
analogWrite(speedL,0);
analogWrite(speedR,150);}

void right(){
digitalWrite(IN1, HIGH);
digitalWrite(IN2, LOW);
digitalWrite(IN3, LOW);
digitalWrite(IN4, LOW);
analogWrite(speedL,150);
analogWrite(speedR,0);}
```

```
void stopp(){  
digitalWrite(IN1, LOW);  
digitalWrite(IN2, LOW);  
digitalWrite(IN3, LOW);  
digitalWrite(IN4, LOW);  
analogWrite(speedL,0);  
analogWrite(speedR,0);}  
  
void loop(){  
sl=digitalRead(sensorL);  
sr=digitalRead(sensorR);  
if (sl==0&&sr==0)  
forword();  
else if (sl==0&&sr==1)  
right();  
else if (sl==1&&sr==0)  
left();  
else if (sl==1&&sr==1)  
stopp(); }
```



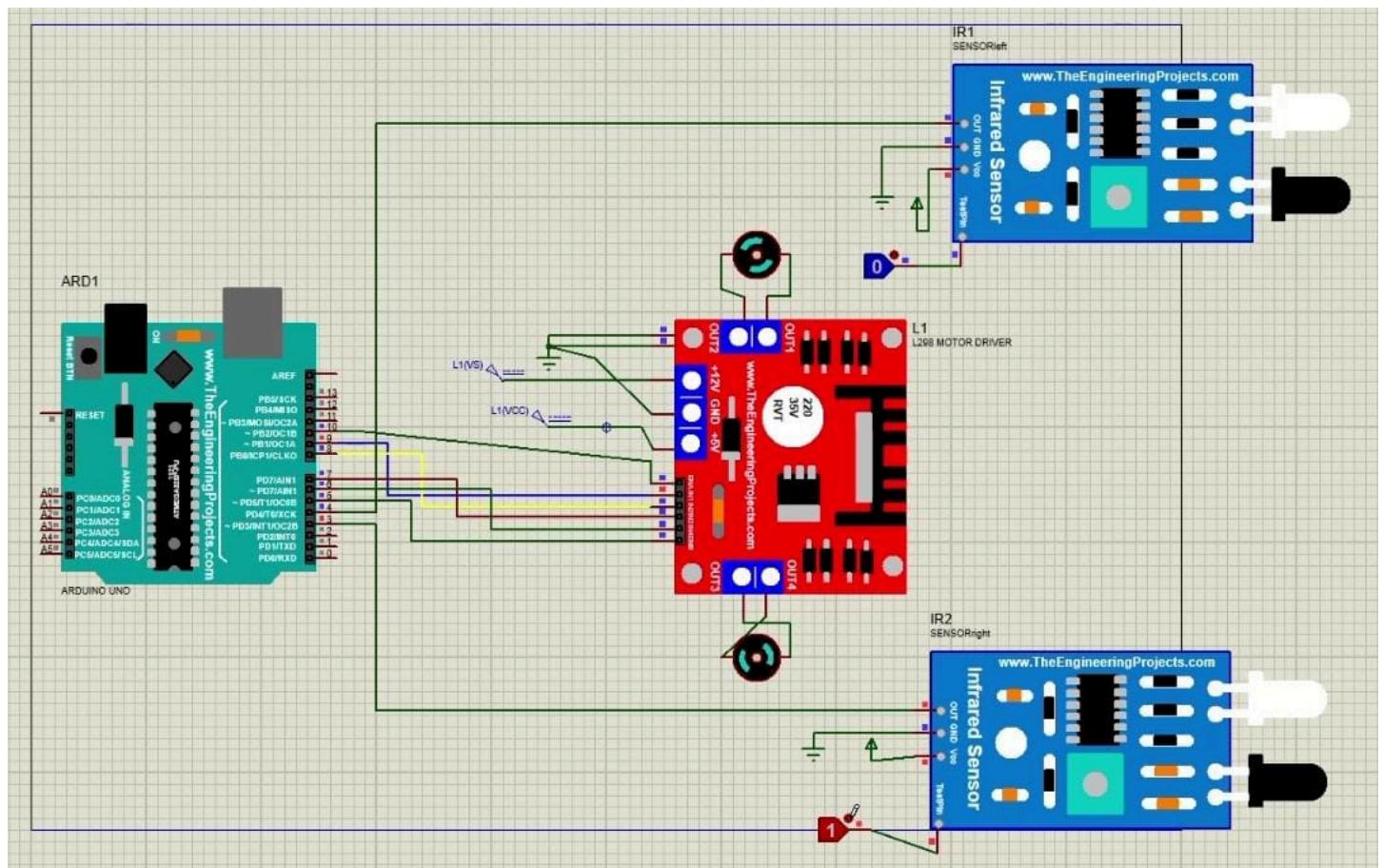


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6. Project connection form





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7. Project components

Arduino Uno

The Arduino Uno is the main controller of the project.

It processes the data received from the IR sensors and sends control signals to the motor driver to determine the robot's movement (forward, left, right, or stop).

IR Line Tracking Sensors (2 Sensors)

These sensors are used to detect the black line on the surface.

- **Left Sensor:** Detects the line on the left side
- **Right Sensor:** Detects the line on the right side

The sensors output digital values:

- 0 → Line detected
- 1 → No line detected

L298N Motor Driver

The motor driver acts as an interface between the Arduino and the DC motors.

It allows:

- Controlling motor direction (forward / backward)
- Controlling motor speed using PWM signals

Arduino cannot drive motors directly, so the motor driver is essential.

DC Motors (2 Motors)

DC motors are responsible for moving the robot wheels.

- One motor controls the left wheel
- One motor controls the right wheel

By controlling the speed and direction of each motor, the robot can turn left, right, or move forward.

Robot Chassis and Wheels

The chassis holds all components together:

- Arduino board
- Motor driver
- Motors
- Sensors
- Battery

The wheels are connected to the motors to allow movement.

Power Supply (Battery)

A battery is used to power:

- Arduino Uno
- Motor driver
- DC motors

It provides the required voltage and current for stable operation.