

# ROBOTICS-MINOR-FEB

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## Line Following Robot

*This is white line follower robot.*

Line follower Robot is a very simple robot that follows a line, either a black line or a white line. These type of robots are very simple to build and is often the first choice for beginners who are getting started with robotics.

### Electrical components required:

#### Component List

Name	Quantity	Component
ULeft URight	2	IR sensor
U3	1	Arduino Uno R3
M1 M2	2	DC Motor
U4	1	H-bridge Motor Driver
BAT1	1	9V Battery

## IR Sensor working:

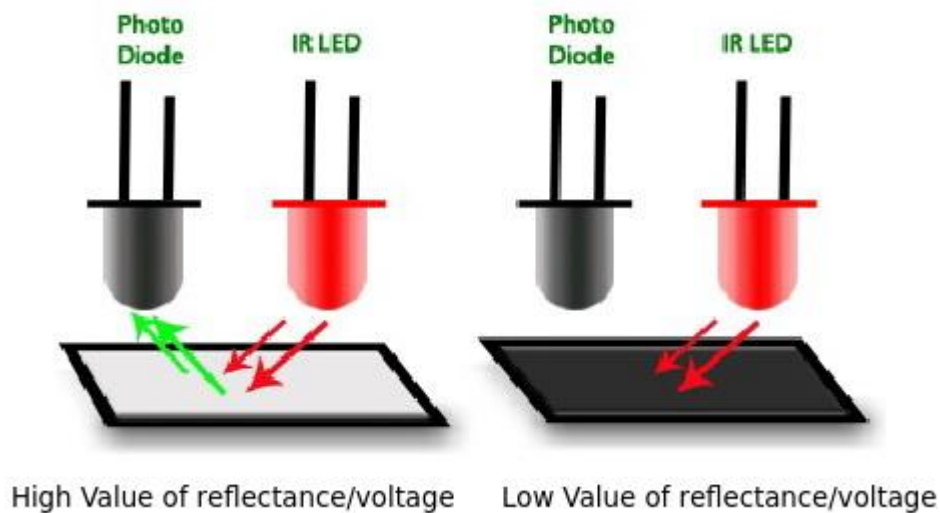
IR sensor gives out IR waves.

When the ray hits the BLACK surface, it gets absorbed and nothing gets received on the receiver.

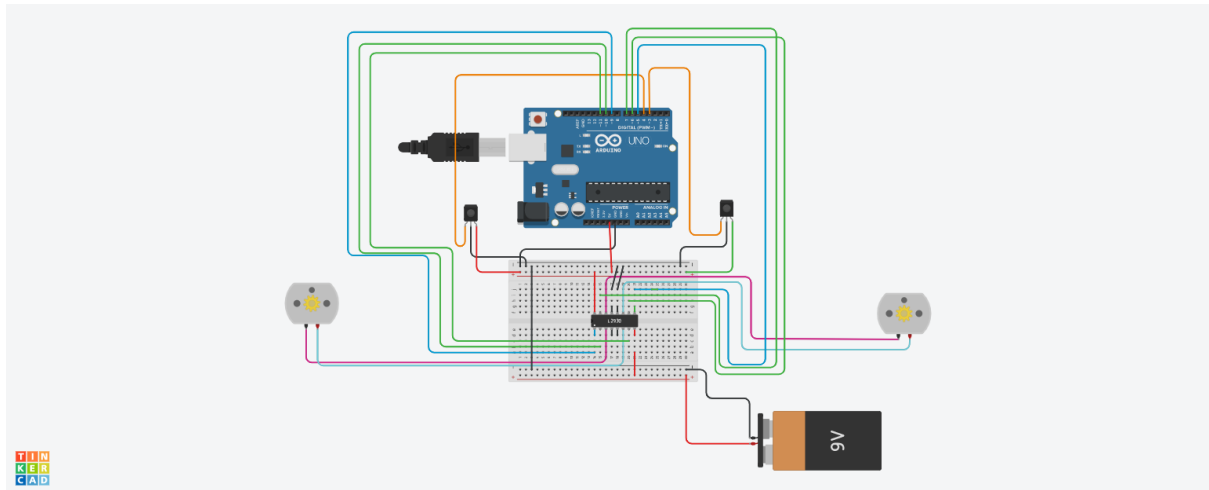
Since nothing is read by the receiver, The digital read is LOW (0)

When the ray hits the WHITE surface, it gets reflected and gets received on the receiver.

Since a reflected is read by the receiver, The digital read is HIGH (1)



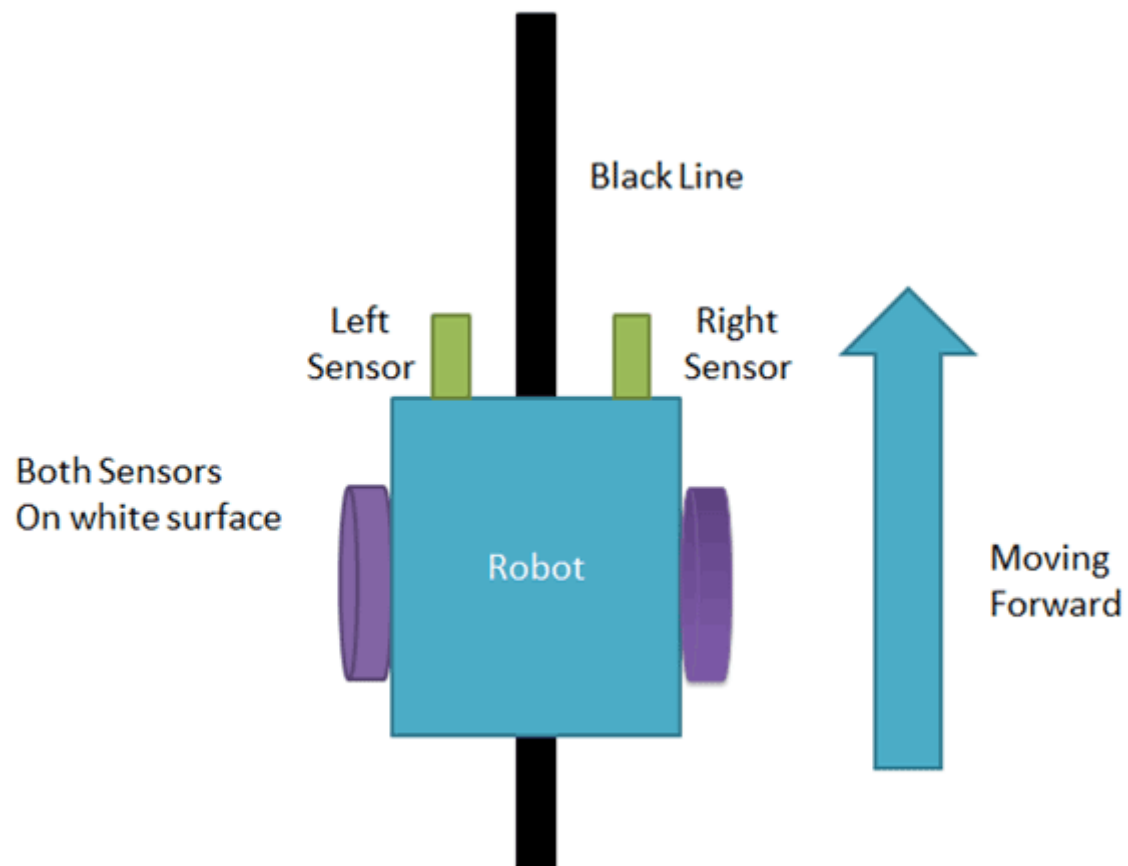
## Circuit Diagram:



## Working of the robot:

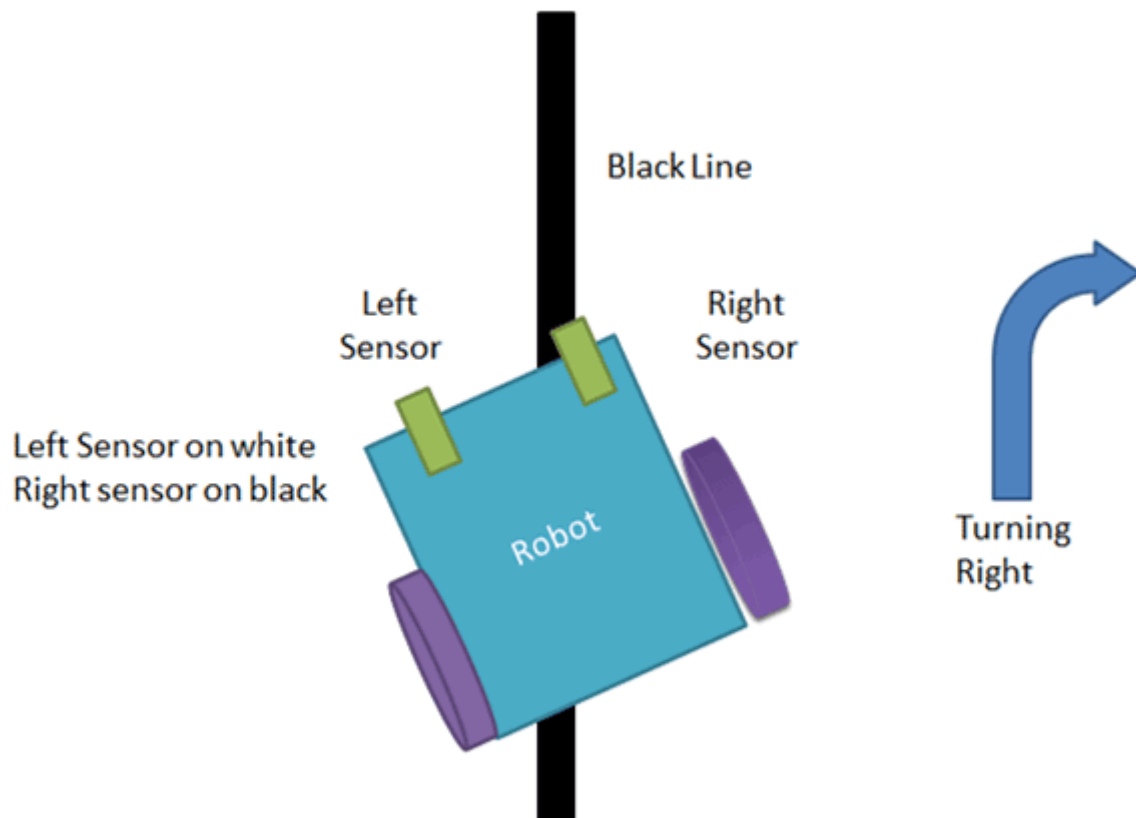
The line follower robot senses a black line by using a sensor and then sends the signal to Arduino. Then Arduino drives the motor according to sensors' output.

In case1, both the sensor give the input HIGH, the robot should move straight.



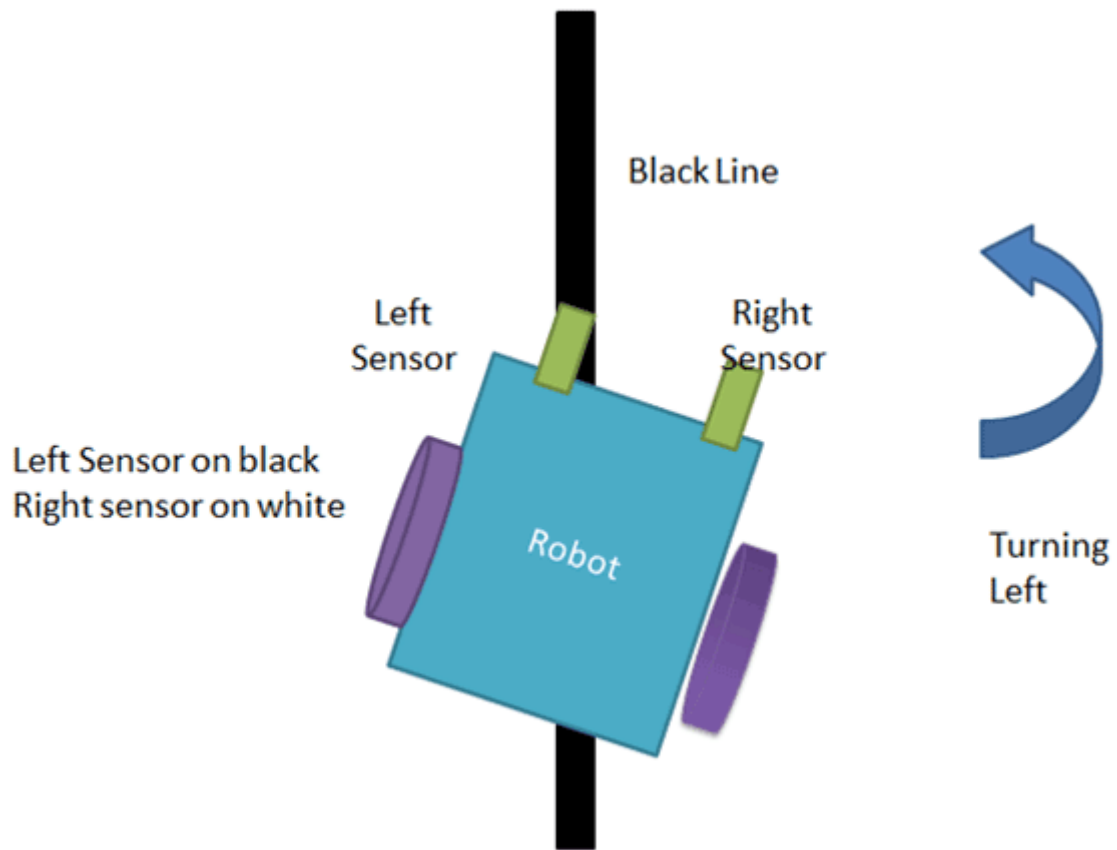
In case2, Left sensor is HIGH and Right sensor is LOW, implying that the right wheel of the robot is on the black line. So, the robot should change its path by turning right.

For that to happen, right motor is completely shut down and the left motor is on

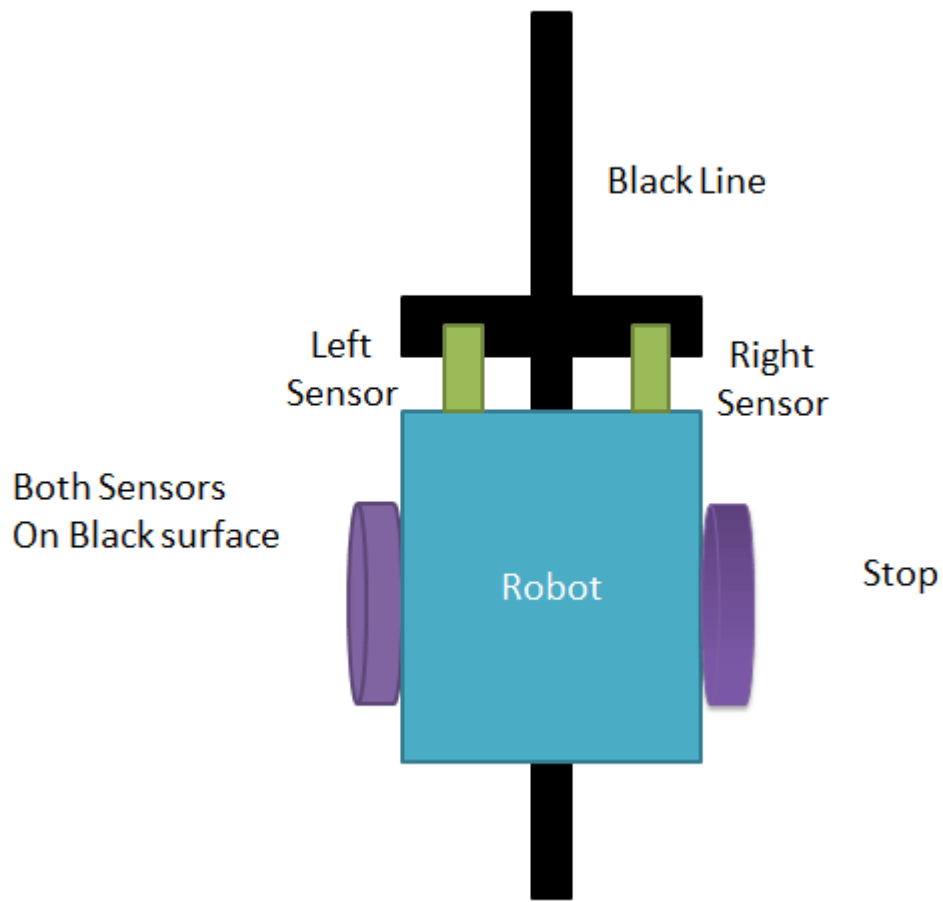


In case3, Left sensor is LOW and Right sensor is HIGH, implying that the right wheel of the robot is on black line. So, the robot should change its path by turning right.

For that to happen, left motor is completely shut down and the right motor is on



To stop the robot.



Code:

```
//left motor
int Enable34 = 9;
int input1_l = 10;
int input2_l = 11;

//right motor
int Enable12 = 5;
int input1_r = 6;
int input2_r = 7;

// Sensors
int LeftSensor;
int RightSensor;

int initialiseMotor(int pin1, int pin2, int activation)
{
    pinMode(pin1, OUTPUT);
    pinMode(pin2, OUTPUT);
    pinMode(activation, OUTPUT);
}
```

```

//Start the motor
digitalWrite(activation, HIGH);
}

int rotateMotor(int pin1, int pin2, bool clockwise = true)
{
    if(clockwise)                // rotates the motor clockwise
    {
        digitalWrite(pin1, LOW);
        digitalWrite(pin2, HIGH);
    }
    else                        // wont rotate the motor
    {
        digitalWrite(pin1, LOW);
        digitalWrite(pin2, LOW);
    }
}

void setup() {
    initialiseMotor(input1_l, input2_l, Enable34);
    initialiseMotor(input1_r, input2_r, Enable12);
    pinMode(4, INPUT); // for left Sensor
    pinMode(3, INPUT); // for right Sensor
}

void loop() {
    LeftSensor = digitalRead(4);
    RightSensor = digitalRead(3);

    if(LeftSensor == 1 && RightSensor == 1)
    {
        rotateMotor(input1_l, input2_l, true);
        rotateMotor(input1_r, input2_r, true);
    }
    else if (LeftSensor == 1 && RightSensor == 0)
    {
        rotateMotor(input1_l, input2_l, true);
        rotateMotor(input1_r, input2_r, false);
    }
    else if (LeftSensor == 0 && RightSensor == 1)
    {
        rotateMotor(input1_r, input2_r, true);
        rotateMotor(input1_l, input2_l, false);
    }
    else
    {
        rotateMotor(input1_r, input2_r, false);
        rotateMotor(input1_l, input2_l, false);
    }
}
}

```