Object Following Robot - Code Explanation

Introduction

This document explains the working of an Object Following Robot using Arduino. The IR sensors detect an object in front of the robot and drive the motors accordingly. The code is explained line-by-line with comments.

Note: The circuit is almost the same as a Line Following Robot (LFR). However, the only slight change is in the positioning of the IR sensors. Instead of placing them below the robot (to detect a line), they should be mounted in front of the robot to detect approaching objects.

Line-by-Line Code Explanation

```
int l_ir = 8;
```
Explanation: Left IR sensor is connected to digital pin 8.

```
int r_ir = 9;
```
Explanation: Right IR sensor is connected to digital pin 9.

```
int s1 = 10;
```
Explanation: PWM pin for controlling speed of left motor.

```
int s2 = 11;
```
Explanation: PWM pin for controlling speed of right motor.

```
int lmf = 3;
```
Explanation: Left motor forward control pin (IN1).

```
int lmb = 4;
```
Explanation: Left motor backward control pin (IN2).

```
int rmf = 5;
```
Explanation: Right motor forward control pin (IN3).

```
int rmb = 6;
```
Explanation: Right motor backward control pin (IN4).

```
int speed = 100;
```
Explanation: Initial speed value for the motors (range 0-255).

```
void setup() {
```
Explanation: Setup function runs once when the robot is powered on.

```
Serial.begin(9600);
```
Explanation: Begins serial communication for debugging.

```
pinMode(l_ir, INPUT);
```
Explanation: Sets the left IR sensor as input.

```
pinMode(r_ir, INPUT);
```

Object Following Robot - Code Explanation

Explanation: Sets the right IR sensor as input.

```
analogWrite(s1, speed);
```

Explanation: Sets initial PWM speed for left motor.

```
analogWrite(s2, speed);
```

Explanation: Sets initial PWM speed for right motor.

```
pinMode(lmf, OUTPUT);
```

Explanation: Sets left motor forward pin as output.

```
pinMode(lmb, OUTPUT);
```

Explanation: Sets left motor backward pin as output.

```
pinMode(rmf, OUTPUT);
```

Explanation: Sets right motor forward pin as output.

```
pinMode(rmb, OUTPUT);
```

Explanation: Sets right motor backward pin as output.

```
void loop() {
```

Explanation: Loop function runs continuously to read sensors and move motors.

```
int l_ir_input = digitalRead(l_ir);
```

Explanation: Reads the value from the left IR sensor.

```
int r_ir_input = digitalRead(r_ir);
```

Explanation: Reads the value from the right IR sensor.

```
if (l_ir_input == 1 && r_ir_input == 1)
```

Explanation: If both sensors detect an object move forward.

```
else if (l_ir_input == 0 && r_ir_input == 1)
```

Explanation: If only right sensor detects turn right.

```
else if (l_ir_input == 1 && r_ir_input == 0)
```

Explanation: If only left sensor detects turn left.

```
else
```

Explanation: If no object is detected stop the robot.

```
void go_forward() {
```

Explanation: Function to move the robot forward.

```
digitalWrite(rmf, HIGH);
```

Explanation: Turn on right motor forward.

```
digitalWrite(lmf, HIGH);
```

Explanation: Turn on left motor forward.

```
digitalWrite(rmb, LOW);
```

Explanation: Turn off right motor backward.

```
digitalWrite(lmb, LOW);
```

Explanation: Turn off left motor backward.

```
void stop() {
```

Object Following Robot - Code Explanation

Explanation: Function to stop all motors.

```
digitalWrite(..., LOW);
```

Explanation: All motor pins set to LOW to stop movement.

```
void go_right() {
```

Explanation: Function to turn the robot to the right.

```
digitalWrite(rmb, HIGH);
```

Explanation: Right motor reverse to turn.

```
digitalWrite(lmf, HIGH);
```

Explanation: Left motor forward to support turn.

```
void go_left() {
```

Explanation: Function to turn the robot to the left.

```
digitalWrite(rmf, HIGH);
```

Explanation: Right motor forward to support turn.

```
digitalWrite(lmb, HIGH);
```

Explanation: Left motor reverse to turn.