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**Line Following Robot**

**June 17th, 2022**

**TEJ3M**

**Amit & Roneet**

**Design Sketch 1:**

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| ***Notes:*** *Considering there are only two motors, less programming is needed to move the robot as it detects the line. The position of the switch allows for easy access. The batteries are on the top because the pack of 6 takes up a lot of space.* |

A picture containing text, toy

Description automatically generated

**Flowchart:**

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**Code:**

/\* Authors: Amit, Roneet

Date: June 6th, 2022

Description: This program is for a line following robot that follows a black line accordingly.

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const int IRSensorLeft = 8; // Left IR sensor on pin 8

const int IRSensorRight = 11; // Right IR sensor on pin 11

const int Motor1APin = 2; // H-bridge logic pin 1A for motor 1

const int Motor2APin = 3; // H-bridge logic pin 2A for motor 1

const int Enable12EPin = 1; // H-Bridge enable pin for motor 1 connect to PWM pin

const int Motor4APin = 4; // H-bridge logic pin 4A for motor 2

const int Motor3APin = 5; // H-bridge logic pin 3A for motor 2

const int Enable34EPin = 6; // H-Bridge enable pin for motor 2 connect to PWM pin

const int SwitchPin = 7; // Switch on pin 7

// Method to setup pins

void setup()

{

pinMode(IRSensorLeft, INPUT); // Set IR sensor 1 as an input

pinMode(IRSensorRight, INPUT); // Set IR sensor 2 as an input

pinMode(SwitchPin, INPUT);

pinMode(Motor1APin, OUTPUT); // Set H-bridge logic pin 1A as an output

pinMode(Motor2APin, OUTPUT); // Set H-bridge logic pin 2A as an output

pinMode(Enable12EPin, OUTPUT); // Set H-bridge enable pin for motor 1 as an output

analogWrite(Enable12EPin, 150); // Setting the enable pin at 150 enables the motor all the time

pinMode(Motor4APin, OUTPUT); // Set H-bridge logic pin 4A as an output

pinMode(Motor3APin, OUTPUT); // Set H-bridge logic pin 3A as an output

pinMode(Enable34EPin, OUTPUT); // Set H-bridge enable pin for motor 2 as an output

analogWrite(Enable34EPin, 150); // Setting the enable pin at 150 enables the motor all the time

}

// Method to loop code continously

void loop()

{

// Store the state of the switch

int SwitchPinState = digitalRead(SwitchPin);

// Store the state of the IR sensors

int stateLeft = digitalRead(IRSensorLeft);

int stateRight = digitalRead(IRSensorRight);

// If the switch is on

if (SwitchPinState == HIGH) {

// NO BLACK LINE, GO STRAIGHT

if (stateRight == HIGH && stateLeft == HIGH) {

analogWrite(Motor2APin, 150);

analogWrite(Motor3APin, 150);

}

// RIGHT IR SENSOR IS HIGH, TURNING RIGHT

else if (stateRight == LOW && stateLeft == HIGH) {

analogWrite(Motor2APin, 150);

analogWrite(Motor3APin, 0);

}

// LEFT IR SENSOR IS HIGH, TURNING LEFT

else if (stateRight == HIGH && stateLeft == LOW) {

analogWrite(Motor2APin, 0);

analogWrite(Motor3APin, 150);

}

// BOTH IR SENSORS ARE LOW, STOP

else if (stateRight == LOW && stateLeft == LOW){

analogWrite(Motor2APin, 0);

analogWrite(Motor3APin, 0);

}

}

// Otherwise the switch must be off

else {

// Turn off all motors

digitalWrite(Motor1APin, LOW);

digitalWrite(Motor2APin,LOW);

digitalWrite(Motor3APin, LOW);

digitalWrite(Motor4APin, LOW);

}

}

**Final Schematic Diagram of Line following ROBOT**

Diagram, schematic

Description automatically generated

Graphical user interface, diagram, schematic

Description automatically generated

Daily Activity Log

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| --- | --- |
| **Student Names:** | Amit Singh Mehmi, Roneet Topiwala |

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| **Date** | **Description of Work Done & By Who** |
| June 1st , 2022 | Amit – Started and finished Tinker CAD Design #1  Roneet – Started and finished Tinker CAD Design #2 |
| June 2nd, 2022 | Amit – Started and completed program flowchart  Roneet – Finalized Final Tinker CAD design |
| June 3rd, 2022 | Amit & Roneet – Built schematic drawing using TinkerCAD |
| June 3rd, 2022 | Amit & Roneet Started building robot |
| June 6th, 2022 | Both continued to build robot, attached most components on the board |
| June 7th , 2022 | Both continued to build robot, attached battery pack at the bottom |
| June 8th , 2022 | Both continued to build robot, attached all wires |
| June 9th , 2022 | Amit & Roneet programmed robot with tinker cad |
| June 10th , 2022 | Both tested out robot on the track |
| June 13th, 2022 | Adjusted sensor placement, robot couldn’t make the turns |
| June 14th, 2022 | Adjusted speed, robot couldn’t make the turns |
| June 15th , 2022 | Used analog Write for the enable pins, robot was going slower and made the turns accurately  Roneet and Amit successfully made the robot complete 2 laps in a row at a consistent speed |
| June 16th , 2022 | Final test for the robot  Roneet and Amit completed the robot and recorded the test of the robot going around for 2 laps. |
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