Motor

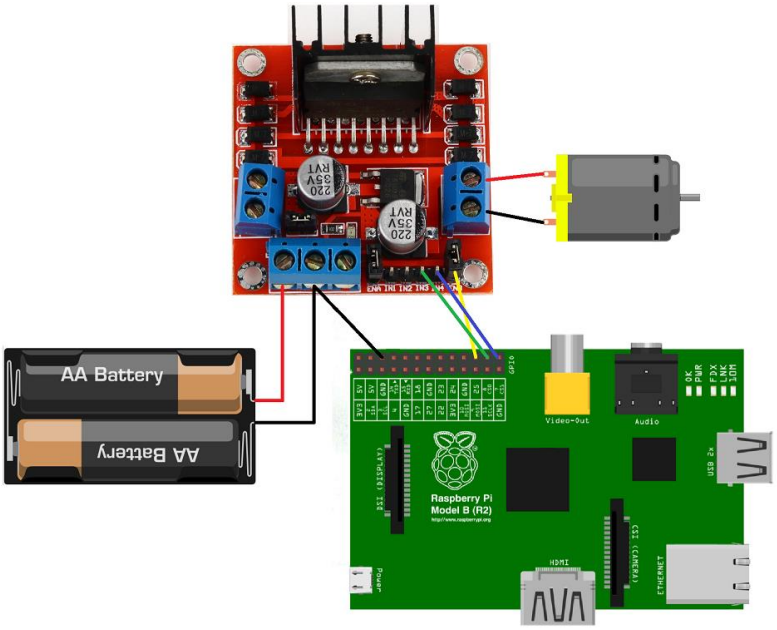
Introduction

This class allows you to control the direction and speed of a motor. This class has four public methods: forwards() and backwards() which sets which direction the motor should spin in, stop() which stops the motor and setSpeed(int speed) which sets the speed of the motor with the fastest spin achieved by setting speed to 100.

Assembly

Parts:

- 3x Female to female jumper cables
- 1x Male to female jumper cable
- H-bridge L298N
- Batteries (with case)
- Motor
- Raspberry Pi



Build Instructions:

1. Power off the Pi completely.
2. Connect pins IN3, IN4 and ENB on the H-bridge to pins 10, 11 and 6 respectively on the pi with female to female jumper cables.
3. Loosen the OUT 4 and OUT 3 screws (the two screws in the blue plastic on the right side of the board) and connect the motors power and ground wires their connectors respectively and secure them in place by tightening the screws.
4. Loosen the 12V and GND screws (the two left most of the screws in the blue plastic at the bottom of the board) and connect the ground pin on the pi to the GND connector, with a male to female jumper cable.
5. Connect the power wire from the battery pack to the 12V connector and the ground wire to the GND connector and tighten both screws. A red LED on the H-bridge should now light up.

Exercises

Exercise 1: Using methods from Motor, fill out method forwardsFullSpeed() which should spin the motor forwards at full speed. Remember to call a method from an object you need to use code similar to: objectsName.methodYouWantToCall().

Exercise 2: Fill out method forwardsSetSpeed(int speed) which should spin the motor forwards at a given speed, depending on int speed.

Exercise 3: Fill out method setDirectionSetSpeed(int speed, boolean forwards) which should rotate the motor in a given direction, depending on the boolean forwards and at a given speed, depending on int speed.

Notes

- Remember, Pi4J using something called WiringPi to manage GPIO pins. This means that the pin numbers do not actually correlate with what is written on the board. Use this website to convert: http://pi4j.com/pins/model-b-plus.html

- If the speed of the motor is set to low it may not spin.

- You can used other H-bridges that the one used in this tutorial, however the L298N lets us control two motors, which will be useful in further projects.

- A method stop() is included in class MotorExercies to allow you to stop the motor while you test out your methods.