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Lab 2
CPE 416
Fall 2023
Due end of lab Friday (10/13/23)

Part 1 (lab2_part1.c)

For this part of the lab, you will implement code which you will use to control the motors on your robot. Your function should have the following prototype:

```
motor(uint8_t num, int8_t speed)
```

num will be 0 or 1 corresponding to the left or right motor. speed will be a number from -100 (full speed reverse) to +100 (full speed forward).

- This function should call set_servo to spin the motor
- A call to set_servo with position of 127 should stop the motor. If your motor spins, you can calibrate your motors by adjusting the servo potentiometer with a screwdriver.

Write a program that:

- gradually spins the motors to full speed forward
- gradually slows the motors to a stop
- does the same in the reverse motor direction and continuously repeats
- while the program is running, print the motor speed on the screen

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Pressing the on-board button should
toggle between the 2 vehicles. The
display should show which vehicle is
running.

Each motor should run from stopped
to full speed depending on the amount
of light received by a sensor. A motor
should not run in reverse.

You should implement the sensors as
described in class.

- You may leave the sensors on
  the breadboard or use jumper
  wires to move them off of the
  breadboard.
- If you move them off the
  breadboard, do **not** glue or
  tape the sensor directly to the
  robot. You may tape the
  sensor to a piece of cardboard
  and then screw the cardboard
  to the robot.

Part 3 (lab2_part3.c)

Write a program that implements
Braitenberg vehicles 3a and 3b.
Pressing the on-board button should
toggle between the 2 vehicles. The
display should show which vehicle is
running.

Part 4 (lab2_part4.c)

**Upload a drawing for a possible
IR line sensor bracket mount.**
The IR line sensor should be
mounted about ¼" from the ground
and should be adjustable side-to-
side. It should attach to the robot

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will print whichever design the class likes best.

In this portion of the assignment, you will implement a line-following program for your robot.

- You should use the proportional control algorithm discussed in class

Your robot should run smoothly on the curved and straight sections of the courses. You may code in special cases for intersections. There will be 3 courses for you to test your robot on:

- oval
- figure-8
- square

Handin

Use handin to turn in your source code. Be sure to put the following header at the top of your source files:

```
Name:  partner1 and
partner2
Assignment number (e.g.
Lab 2 part 1)
Description: a sentence
describing what this
program does
...
...
...source code...
...
...
```

handin command: `handin jseng CPE416_lab2 filename.c`

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