**ENGR 100: Individual Robot Programming Assignment**

Directions: Please answer the following questions on this handout. This assignment uses code written for the following robot:



* Left motor = Port A
* Right motor = Port C
* Touch sensors = Ports 1 & 3 (sensors pointing ahead)
* Light sensor Port 2 (sensor pointing towards ground)

Note the orientation of the connection wires. By connecting the wires differently to the output ports, the motors will turn in a different direction. The following diagram shows the settings required to move the robot forward (both arrows pointing up):



Gearing

1. Which way does the motor (small gear in center) need to turn to have wheel 2 move forward?



1. Do Gears 1 and 2 rotate in the same direction? YES NO

1. Would the robot move faster if the diameter of the Gears 1 and 2 were larger? Why or why not?

1. Would increasing the diameter of Gears 1 and 2 allow the robot to be able to climb easier over obstacles? Why or why not?

1. Would the following gear set-up increase or decrease torque (small gear on left is the motor and the wheel is attached to the large gear on the right)?



Programming

**Program 1:**

1. Write several sentences that explain EXACTLY what the robot does when executing this program. Be sure to include details about relative speed and which direction the robot turns.



1. How else could you program the robot to turn? Is there a way to make the robot turn slower or faster?

Program 2:



The robot runs on the following track. Note that the light sensor points towards the floor and registers a value between 50-55 when it is directly over a dark line.



**Think very carefully before answering the following questions!**

1. **How many times does the robot beep?**
2. **At which line (measured from the left) does the robot stop?**