Homework 3 Part 1

1. Describe the differences between a continuous rotation servo motor and a DC motor, both of which have been used for robot designs in Lab3. What additional component do you need to better operate the DC motors? Do you need this component with the servo motor? Why or why not?

2. What is the best way to power the DC motors, the Motor Controller and the RaspberryPi. Show a sketch of the circuit indicating power and ground for motors, motor controller and the microprocessor.

3. Expand the circuit diagram in the last question to include control signals for the motors. Please show any resistors you need to include in this drawing.

4. With the motors attached to the robot frame, the robot and Raspberry Pi, become elements of a mobile embedded system. Suppose you want the robot to travel in a straight line for a specific distance. Describe one possible method for achieving straight-path travel, over some specific distance. What other considerations might you have to keep in mind (hint: think robot physical safety even when the robot is travelling in a straight line)?

5. One solution for displaying the right and left logs for the rolling_control.py program from lab three would be to use a python dictionary. The dictionary for the left log might be organized as:

```
Left_log = { stop:(80,140), clockwise:(80,160), counter_clock:(80,180) }
```

   Where the keys represent the log event and the values represent the position of the log on the screen in an (x,y) coordinate tuple. Describe the flaw when using this structure and suggest one method to correct it.