Roller Coaster Design Project

Lab 4 Procedure: Arduino Introduction
Arduino Introduction

- Today in lab, we will cover building and programming of:
  - A basic 'blinker' circuit as well as
  - Two servo motor Arduino projects
Task 1: The Blinker

- An LED that blinks on and off every second, with a 50% duty cycle

- You'll need an LED, a breadboard, some jumper wires, and a resistor

- Reference the code and schematic on the following slides
Pseudo-code

- **setup() function**
  - Set a digital pin to output
    - Use the pinMode(<pin>, (OUTPUT|INPUT))

- **loop() function**
  - Turn on LED
    - Use the digitalWrite(<pin>, (HIGH|LOW)) command
  - Wait 1000ms
  - Turn off LED
  - Wait 1000ms

- Alternate ways of doing this?
- Turn the blinker on/off with Serial input?
- Going further: Fade the light in and out?
Circuit
Task 2: Servo Control

- Create a simple arduino program that illustrates the basics of controlling a servo
- You'll need the breadboard and some jumper wires along with the servo
- The servo must be connected to a port with a ‘~’ by the port number
Pseudo-code

- **Header**
  - Declare servo & position variables
    - Import the ‘Servo’ library from the ‘Sketch’ menu
    - Use the 'Servo' type to declare a servo object
- **setup() function**
  - Attach the servo
    - Use <myservoname>.attach(port number of signal wire)
- **loop() function**
  - loop through all positions (or speeds) by increments of 1, with a delay of 15ms between each
    - Use <myservoname>.write(<mypos>) to set positions
  - Have the loop built such that the servo alternates back and forth (speeds up then down)
Circuit
Servo Round 2 (Time Permitting)

- Modify your code to respond to user input via the Serial terminal
- In setup you'll need Serial.begin(<speed>) to open the port
- In your loop, you'll need to use Serial.available() to see if anything is on the serial port
  - If it is, you'll need to use Serial.read() to get a character.
  - Recommend using characters 1-9 as different positions to change to.