Expt. 2 Rubric (Last Updated : 2009-07-01)

Note: Always credit the work of others (i.e. write your lab partner's name at the top of your report)

Introduction: Statement of the problem (What is the goal of this experiment? What are we ultimately trying to measure, calculate, and describe? Why is this worth doing? Write a brief summary of procedure. Include all major equations used in your calculations. **(Minus 1 point for not doing this part)**

Measurements and associated uncertainties for:

- h1: Height of one photogate
- h2: Height of the other photogate
- x: Distance of track between photogates
- w: Track inside width
- M: Mass of racquet ball
- R: Outer radius of racquet ball.
- t: t_bar and standard deviation of t_bar for (1 Ball N times) and (N balls 1 time) trials.

Plots: First, for the 1 ball N times time data, plot both the standard deviation and standard deviation of the mean as a function of the trial number N. Next, create **ONE** histogram for time data for **1** ball N times. See guidelines for recommended procedure on creating your histogram. Comment on the shape and meaning of the histogram, what it says about your data, and how it agrees with your expectations.

Calculations/Error Analysis:

R' (rolling radius) and its uncertainty
I (racquet ball moment of inertia) and its uncertainty. In calculating I, you may take g to be a constant without an uncertainty, i.e. g=9.81m/s^2
Estimate of sigma_d/d. Briefly discuss the meaning of your result.
Estimate of N (See section 3.4 in guidelines). Briefly discuss the meaning of this result.

Conclusion: Apply Chauvenet's criterion to your largest outlier (1 ball N times); comment on whether or not

you are justified in keeping this data point. For your 1 ball N times data, how many data point do you expect to find at $|t| \geq 2$? How many do you actually observe? Comment.

Discuss sources of error that you think are not already accounted for in your uncertainty estimates, and whether or how they may have affected your results. This includes discussing systematic errors and major sources of random error.

NOTE: "Human error" conveys no useful information.