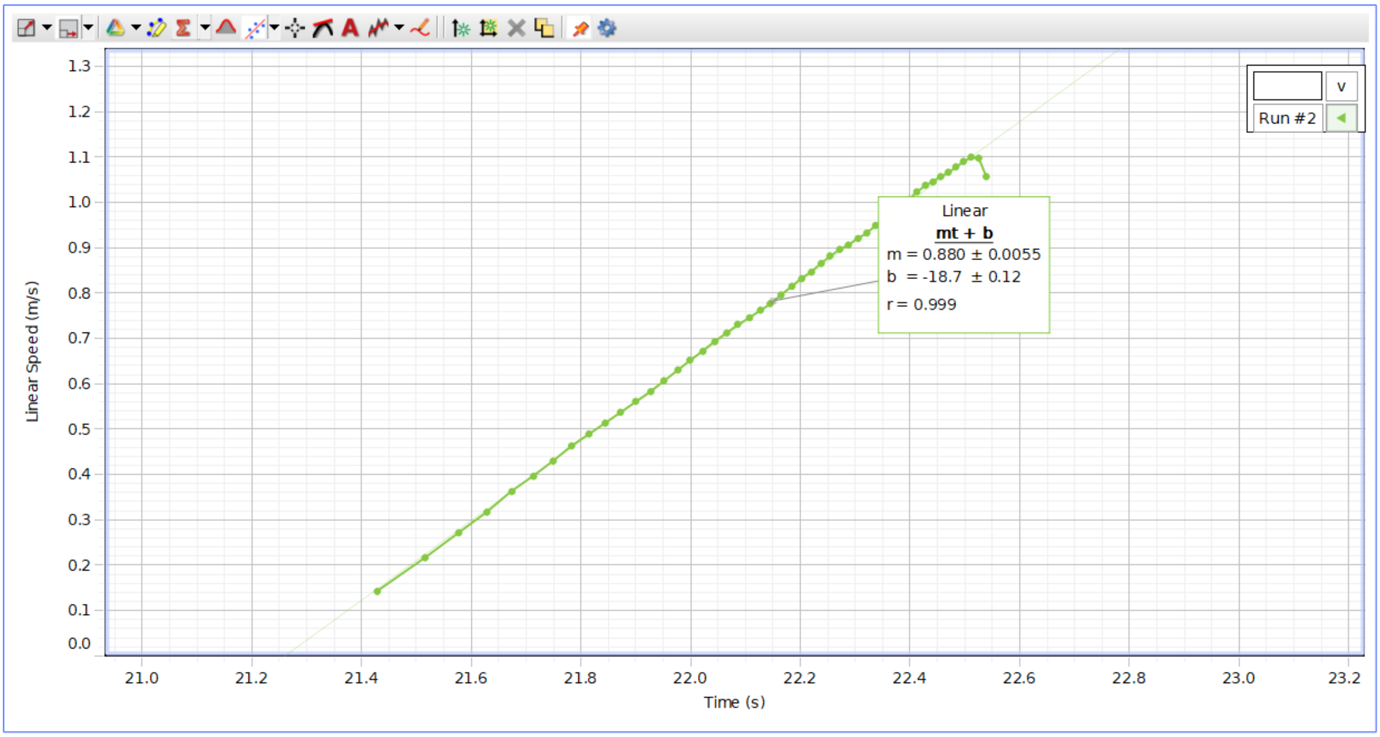
Name	Roman MAKSIMOVICH	LA (I)

B. Results and data analysis (64 pts)

Table 1: Constant total mass (32 pts)

Paste the linear speed vs. time graph here.



Trial	M_1 (kg)	M_2 (kg)	a_{exp} (m/s^2)	F_{net} (N)	$M_1 + M_2$ (kg)	a_{theory} (m/s^2)	Percent error*
Run#1	0.105	0.155	1.60	0.491	0.260	0.887	15.2%
Run#2	0.115	0.145	0.880	0.294	0.260	1.13	22.1%
Run#3	0.125	0.135	0.168	0.098	0.260	0.377	74.0%

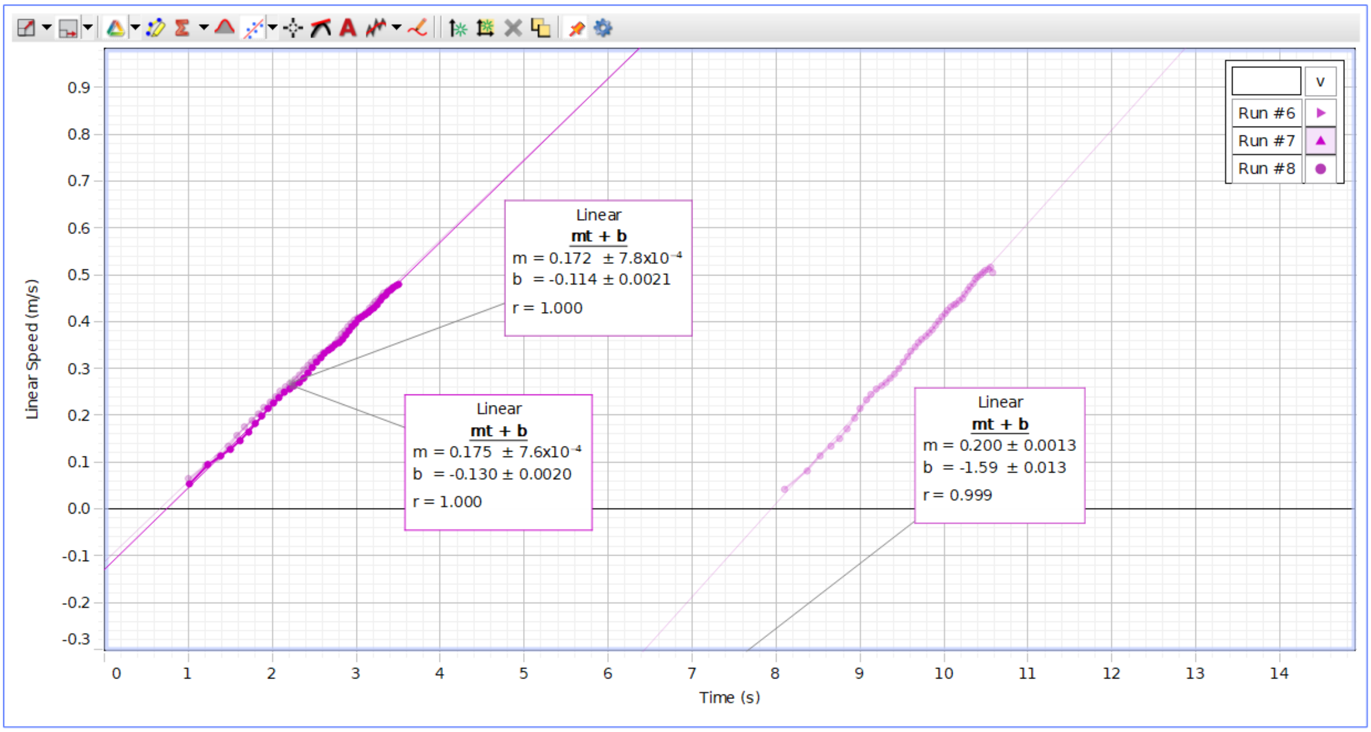
- Calculate the net force $F_{net} = g(M_2 - M_1)$.
- Calculate the theoretical acceleration $a_{theory} = g\left(\dfrac{M_2 - M_1}{M_1 + M_2}\right)$.

***** NOTE:** Use g = 9.81m/s^2 for all the calculations in this laboratory course. *******

$$\text{* Percent error} = \frac{|a_{exp} - a_{theory}|}{a_{theory}} \times 100\%$$

Table 2: Constant net force (32 pts)

Paste the linear speed vs. time graph here.



Trial	M_1 (kg)	M_2 (kg)	a_{exp} (m/s^2)	F_{net} (N)	$M_1 + M_2$ (kg)	a_{theory} (m/s^2)	Percent error
Run#1	0.105	0.110	0.200	0.0491	0.215	0.228	12.3%
Run#2	0.115	0.120	0.175	0.0491	0.235	0.209	16.2%
Run#3	0.125	0.130	0.172	0.0491	0.255	0.192	10.6%

- Calculate the net force $F_{net} = g(M_2 - M_1)$.
- Calculate the theoretical acceleration $a_{theory} = g\left(\frac{M_2 - M_1}{M_1 + M_2}\right)$.

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C. Answer the following questions after the experiment (7 pts each)

2. Compare the values of the percent error between the measured value of the acceleration and the theoretical value, as shown in Tables 1 and 2. What are the main sources of error in this experiment?

3. Why is a better result obtained when you use a very large net force?

4. In the calculation of the acceleration a, we have assumed that the pulley is frictionless. Can you find a simple way in the experiment to test whether this is true? If so, how to correct for it?