**Error Propagation**

In one of the General Physics II Labs, you computed the speed of a wave travelling through a string in multiple ways.

In the first method, you measured the length of the string and varied the frequency of oscillation until a standing wave appeared. You then used the universal formula for the velocity of a wave:

(Eqn 1)

To compare, you also computed the the velocity using the force of tension in the string and the linear mass density:

(Eqn 2)

Suppose these are your measurements:

T = 4.41 +/- .01 N

Mass of 10m of string (for linear mass density) = 14.24 +/- .01 g

Length of string (for linear mass density) = 10.00 +/- .01 m

Wavelength = 3.46 +/- .01 m

Frequency = 15.2 +/- .1 Hz

Answer the following questions:

1. Use error propagation to compute the resulting velocity and the associated error using each equation. Do the two methods agree?
2. Use the code from the error propagation introduction to verify that the Monte Carlo approximation produces a similar result for each equation.
3. Which of the two methods of determining wave velocity is more precise? Why?
4. For each equation, identify the dominant source of error (i.e. which measurement appears to make the largest contribution to our overall uncertainty)? Be sure to explain your reasoning.