A ball of mass $m = 5$ kg is dropped from an airplane. As the balls falls vertically, air resistance exerts a force on the ball opposing its motion. The force of the air resistance has a magnitude $F_{air} = bv$, where b is a constant and v is the magnitude of the ball's velocity.

Use a computer to model the motion of the ball. Excel works well, but you may use another tool if you wish.

Your task is to understand and explain the motion of the ball. Use the position and momentum update formulas to predict the motion of the falling ball.   Draw graphs of the position and velocity as a function of time. Assume that the air resistance constant is $b = 7$ Ns/m. Use a time step of 0.1 s to start and make a table of 100-500 points. However, be sure to try other time steps to make sure you believe your conclusions.

Turn in

1) A description of your computer program or calculation, including the formulas you used.

2) Graphs of position and velocity vs. time.

3) A table showing your calculations (one page of the table is enough).

4) A description of the motion of the ball, including a unique aspect of this problem that we have not discussed in class (hint: this new concept is something you have probably heard of).