Homework 2

1. Cut/paste the code for the projectile problem discussed in class (note: that listing is not quite complete: you will need to look at earlier codes to see how to access the 3D environment and how to set the scaling and range).

2. Modify the line updating the velocity vector to add an air resistance force proportional to the velocity:
   `ball.vel=ball.vel+force*dt-k*dt*ball.vel`
   where the constant k must be asigned earlier in the code.

3. Also add a line *after* the `while` loop to print out the horizontal distance travelled (be careful the range of the projectile is the final x-coordinate minus its initial value).

4. Run the code for $k = 0$ (no air resistance). Compare your answer to the exact result (consult standard PHY211 like textbooks to find the formula for the range of simple projectile motion in terms of the angle of projection, speed and acceleration due to gravity. Notice that the latter is set to $g = 1$ here).

5. Now compute the range for $k = 0.01$, and $k = 0.1$. Include screen shots of the trajectory.

6. Optional: calculate the range for $k = 0.001$ as the speed of projection varies. Draw a plot of your results. Compare it to the same curve for $k = 0$