Homework Set 2 Due 09/18/12

Visualization of the results of your simulation is crucial when communicating your results to the rest of the world.

Consider a ball thrown upwards vertically at 20 m/sec which comes back down to the same spot it was launched from.

1. Assuming only gravity is acting, identify expressions for its acceleration, position and velocity.

2. Create a program which calculates the ball's acceleration, position and velocity during the time it is in free fall. Why do you not need an integral for this?

3. Once the program in (2) is validated, modify the code so you are able to visualize the ball's position directly. That is, create an animation of the ball being thrown upwards and falling back down.

4. Now, add visualization capability so that the ball's velocity is expressed through a color scale of your choice and create an appropriate animation with the two balls side by side.

5. Add visualization capability so that the ball's kinetic energy is expressed through a color scale of your choice and create an appropriate animation with the three balls side by side.