Numerical ODE HW 3

1. Implement the RKF45 scheme described in wikipedia "Google wiki Runge–Kutta–Fehlberg method". This is not ode45 and consists of two schemes (one of order 4 and the other of order 5) that share the same function evaluations. The stepper should take in y_n and h_n and output the order 5 estimate and an estimate for the error.
2. Implement the Dormand-Prince scheme described in wikipedia "Google wiki Dormand–Prince method". This is ode45 and again consists of two schemes (one of order 4 and the other of order 5) that share the same function evaluations. The stepper should take in y_n and h_n and output the order 5 estimate and an estimate for the error.
3. Write a step size controller which you can use with the 23 and both 45 schemes. Make sure you explain what it is doing. Use your step size controller and both schemes to solve the gravitational problem. Compare the number of function evaluations, succesful steps, and unsuccesfull steps used for both your schemes (in a fixed step size and variable stepsize formulation) and your favorite prebuilt solver. Report wall clock times for your schemes and check that they are reasonably consistent with your expectations.