Lab-13

1. Write a 4th order Runge-Kutta code to solve the second order differential equation for the forced damped oscillator $(x'' + Bx' + x = f\cos(\Omega t))$. The inputs to the functions should be the time step size (Δt), initial conditions, time of simulation, and the parameter B, f and Ω.

   For B = 0.1, $\Omega = 1$, f = 1, plot the position as a function of time from t =0 to t = 100. Assume the particle is at rest at the origin at t = 0. For undamped and unforced case, plot position, velocity and energy as a function of time. For the above case find how the global error (say for time interval from t = 0 to t = 1000) scale with the step size Δt.