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Falling Parachutist problem

① A parachutist of mass, $m = 68.1$ kg jumps out of a stationary hot air ballon. The velocity of the falling parachutist is determined by solving the differential equation given by,

$$m\frac{dv}{dt} = mg - cv \longrightarrow (1)$$

with initial condition: $v(0) = 0$.

and $g = 9.8$ m/s.

drag co-efficient, $c = 12.5$ kg/s.

- Compute the velocity in eq(1)., numerically using finite divided

difference approximation (Euler's method).

Perform the computation till it attains $V(t_{max}) \approx$ constant. (i.e. terminal velocity).

Employ a step-size of

i) $dt = 2\,s$ $\quad (dt = t_{i+1} - t_i)$

ii) $dt = 1\,s$

iii) $dt = 0.1\,s$

steps

- Plot and compare the results obtained from (i), (ii) and (iii) with the analytical solution.