**Problem:**

A solid sphere falls through a viscous fluid under gravity. It experiences downward weight and upward buoyancy and viscous drag. We study the velocity using both analytical and numerical approaches.

**Parameters:**

* Sphere radius = 0.005 m
* Sphere density = 2500 kg/m³
* Fluid density = 1000 kg/m³
* Viscosity = 0.1 Pa·s

**Results:**

* **Analytical** solution derived using exponential decay to terminal velocity.
* **Numerical** solution computed using Euler’s method.
* Plot shows good agreement between the two approaches.
* To validate the numerical solution using the Euler method, simulations were run for different time steps (Δt). The results showed overshooting for Δt = 0.01 and undershooting for Δt = 0.001, while Δt = 0.003 closely matched the analytical solution.

