Lab-12

1. Solve the first order differential equation $\frac{dv}{dt} = -\gamma v^2 \text{sgn}(v) + f_0 \sin(\omega t)$ using the three different Euler methods. Put $\gamma = 0.1, f_0 = 1, \omega = 1 and v(0) = 1$ to start with. Later explore what happens for various combinations. Can you make sense of the results for various regimes?

2. In the above problem integarte till T = 10 using all three methods and see how the global error scales for each of the method with step size. Are the results along expected lines?