

Programming assignment #1 for Math 55200

(Submit a report in PDF to canvas under Assignment by 11:59PM March 9)

Solve the following IVP by the 4th-order Runge-Kutta method using  $h = 2^{-n}$ ,  $n = 2, 3, 4, 5, 6, 7, 8$  to find the solution at  $T=10$ . Plot the solutions in  $[1,10]$  from different meshes and compute the order of accuracy by the formula derived in the class using the solutions at the endpoint  $T=10$ .

$$y' = \frac{1}{t^2} - \frac{y}{t} + \sin(t)y^2$$
$$y(1) = -1$$