30/7/2019

Assignment-1:

Consider the initial value problem,

$$y' = -ay; \quad y(0) = 1,$$

where the number 'a' equals to last two digits of your Entry Number. Solve it in the open interval (0, 5).

Implement following methods in MATLAB (or Python) for solving above IVP and find errors with respect to exact solution:

1. Euler Method
2. Improved Euler method (or Heun method)
3. Backward Euler method
4. Runge-Kutta method of order 4 (RK-4).

Moreover, compare the results corresponding to different step sizes (h = 0.01, 0.1, 0.2, 0.5):

Note that:

1. Proper documentation should be used in the codes
2. You have to submit a program and a document containing results/discussion on Moodle by 6th Aug 2019. Name of the file should be: "**Ass1_EulerM1_EntryNu**"
3. Evaluation of this assignment shall be based upon a Practical Test based upon this assignment in the practical class on 7th Aug 2019, during your Slot/Group time.
4. Total Marks for this assignment = 4.
5. No cheating allowed.
6. You have to implement algorithms for different methods by yourself. Inbuilt code may be used for comparison purpose only.