Assignment 4 (Due 23:59 Friday 8th November):

Task: Adapt your code from Lab 10, Q6 to solve a third-order DE.

Details: The task is to solve the equation

$$y''' + A\, e^{x} y' - y = 0$$

With the initial conditions

$$y(0) = 2, \qquad y'(0) = 0, \qquad y''(0) = 0\,.$$

The constant A should be the final number of your student ID *unless it is zero,*
in which case you should use A = 9.

Your code should be a standalone python script that solves the above equation and plots $y(x)$ on the interval $x \in [0,10]$.

Important notes:

The solution must be submitted as a stand-alone python file. **This code should include everything it needs to run by itself, i.e. it should include your Runge-Kutta procedure as well as any other functions it needs within a single python file.**

The module must work on the first try. If it does not then marks will be deducted.

Files to submit:

1. assignment4.py — Python code that can be executed to plot the solution **Important: This code should include everything it needs to run by itself, i.e. it should include your runge-kutta procedure as a function within this file.**
2. Lab10_Q6.py — The code from Lab 10 that you modified to solve the problem

Grading

The code will be graded according to the following scale:

Compliance: (This is whether the code is submitted as instructed)	30%
Effectiveness (i.e. whether the code gives the correct answer):	50%
Comments (whether they are comprehensible):	20%

Important information (academic integrity):

1. You have to write the code yourself. Any copying of code from an external source other than the lab solutions that you provide will result in a mark of zero being awarded.

2. **The code must be clearly adapted from your Lab solutions.** If the code does not do this then a mark of zero may be awarded. If your code from the Labs does not work then you can use the Lab Solutions provided on Canvas (include these files in the upload instead of your own).