

**SIF3012 Computational Physics**  
**2025-2026 Semester 1**  
**Lecturer: Juan Carlos Algaba**  
**BLOCK 1**

**Exercise 1**

Consider the differential equation  $\frac{dy}{dt} = 2y(1 - y)$ , where  $y(0)$  is given by the last two numbers of your metric number. Carry out Euler's method with a step size of  $h=0.125$  to manually calculate  $y(0.125)$  and  $y(0.25)$ .

**Exercise 2**

Compute a python program to carry out Euler's method of the equation above with a step size  $h=0.125$  to calculate  $y(10)$ .

**Exercise 3**

Compute a python program to carry out Euler's method of the equation above with a step size  $h=0.00125$  to calculate  $y(10)$ .

**Exercise 4**

Plot the results of Exercises (2) and (3) above. Check if there are any significant differences and, if so, reason why.