

## *NC301 $\mu$ Introduction to Numerical Computing with SciPy*

### Mission 2: Solving a linear algebra problem

This assessment evaluates the following competencies:

- *PP401 – Use Numpy to represent multidimensional arrays and perform operations with them (+1)*
- *NC490 – Solve a given basic problem with the Scipy ecosystem (+2)*
- *PP404 – Use Numpy to solve linear algebra problems (+2)*

You may also be assessed on the following competencies:

- *NC401 – Compare different numerical computing algorithms regarding performance and precision (+2)*

In this mission, you have to find a problem that can be described mathematically as a linear algebra problem, and solve it using the features of the `numpy` module. SciPy ecosystem. To succeed the mission, you have to:

1. Find and understand a problem that can be solved using linear algebra.
2. Write a program that can solve any instance of the problem, giving its parameters, using the `numpy` module.
3. Explain to the teacher the problem you selected, its mathematical description and the code you wrote to solve it.

Optionally, you may experiment with several different techniques to solve your problem and compare them. For example, if your problem requires to invert a matrix, there are several ways to do it with `numpy`. Examples of problems that can be solved with linear algebra are:

- solving systems of linear equations;
- computing 2D or 3D affine transforms of shapes;
- compressing a picture for it to use less space on the computer;
- ...