

## Practical Sheet 1

1. Implement one Python script to perform basic arithmetic operations, including exponentiation.
2. Implement one Python function that obtains the sum of one matrix, according to two different dimensions.
3. Implement one Python function that counts the number of elements in a matrix inside the  $[a,b]$  interval.
4. Implement one Python function that plots (using Matplotlib) the value of  $y=x^2*\cos(2x)$  in the  $[a,b]$  interval.
5. Implement one Python function to obtain the solution to the following system of linear equations:

$$\begin{cases} 4x_1 - 5x_2 = -13 \\ -2x_1 + 3x_2 = 9 \end{cases}$$

6. Implement one Python function that receives a set of numeric values from the keyboard and returns the filled matrix.
7. Implement one Python function that receives two natural values (rows x columns) and generates a random matrix of the corresponding size, with values uniformly distributed in the unit interval.
8. Implement one Python function that checks if a matrix is symmetric or not.
9. Implement one Python function that gets the trace of one matrix.
10. Implement one Python function that obtains the inverse of one matrix.
11. Implement one Python function that obtains the inner product between two vectors.
12. Implement one Python function that obtains the outer product between two vectors.