

Block I

Exercise 1

- Implement a function `TridiagonalSolver(d, o, u, r)` that takes four arrays containing the diagonal elements (**d**), the elements above the diagonal (**o**), the elements below the diagonal (**u**), and the independent terms (**r**) of a tridiagonal system of equations, and returns an array with the solutions of the system. Note that if the system has **n** unknowns, the arrays **d** and **r** must have size **n**, while **o** and **u** must have size **n - 1**.
- Perform calculations for different matrix sizes and represent the calculation time as a function of the size. Use the Python function `time.time()` with `import time` or similar to record the resolution time.
- Solve the system of equations by calculating the inverse of the matrix using the library `numpy.linalg.inv` and using the library `np.linalg.solve`. Perform the calculations for different system sizes and, as in the previous case, graphically represent the calculation time as a function of the size. What conclusion do you draw about the efficiency of these methods?