

# System of linear equations

Numerical methods used to solve such problem allow to introduce and experiment on [Time\\_complexity](#), considering cubic time behavior of standard algorithms and *i.e.* quadratic time solutions using LU decomposition.

- [System\\_of\\_linear\\_equations](#)
- [Gaussian\\_elimination](#), Gauss and Gauss-Jordan eliminations (diagonalization, triangularization)
- [Pivot\\_element](#), pivoting
- [LU\\_decomposition](#)
  - [Triangular\\_matrix#Forward\\_and\\_back\\_substitution](#)
- Time complexity analysis
  - Hint : in Python, use the timeit module

References :

- Numerical recipes, The Art of Scientific Computing 3rd Edition, William H. Press, Saul A. Teukolsky, William T. Vetterling, Brian P. Flannery, 2007, isbn: 9780521880688
  - <http://numerical.recipes/>
  - [http://www2.units.it/pl/students\\_area/imm2/files/Numerical\\_Recipes.pdf](http://www2.units.it/pl/students_area/imm2/files/Numerical_Recipes.pdf)
  - <http://apps.nrbook.com/empanel/index.html#>

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