Numerical integration

Calculation of definite integrals implies to replace the function by another one (usually a polynomial form) which is a good approximation and easier to compute. ☒Error estimation depends on parameters of the method and refinement of spatial grid discretization. It is interesting to check these errors using various algorithm and mesh resolution.

- Equally spaced methods :
  - ☒Numerical_integration
  - ☒Trapezoidal_rule
  - ☒Newton–Cotes_formulas
  - ☒Simpson's rule and composite Simpson's rule
- If intervals between interpolation points vary :
  - ☒Gaussian_quadrature
- Chapter 4 in the book "Numerical Recipes" : Integration of Functions
  - 4.0 Introduction
  - 4.1 Classical Formulas for Equally Spaced Abscissas
  - 4.2 Elementary Algorithms
  - 4.5 Gaussian Quadratures and Orthogonal Polynomials
- Python SciPy library : SciPy Reference
  - Integration (scipy.integrate)

Références

- 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/
    - in C : http://apps.nrbook.com/c/index.html
  - http://www2.units.it/ipl/students_area/imm2/files/Numerical_Recipes.pdf, p 129…
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