Formula di Taylor

$$f(x) = \sum_{k=0}^{n} \frac{f^{(k)}(x_0)}{k!}(x - x_0)^k + r_n(x, x_0)$$

$$r_n(x, x_0) = o((x - x_0)^n) \quad \text{(Peano)}$$

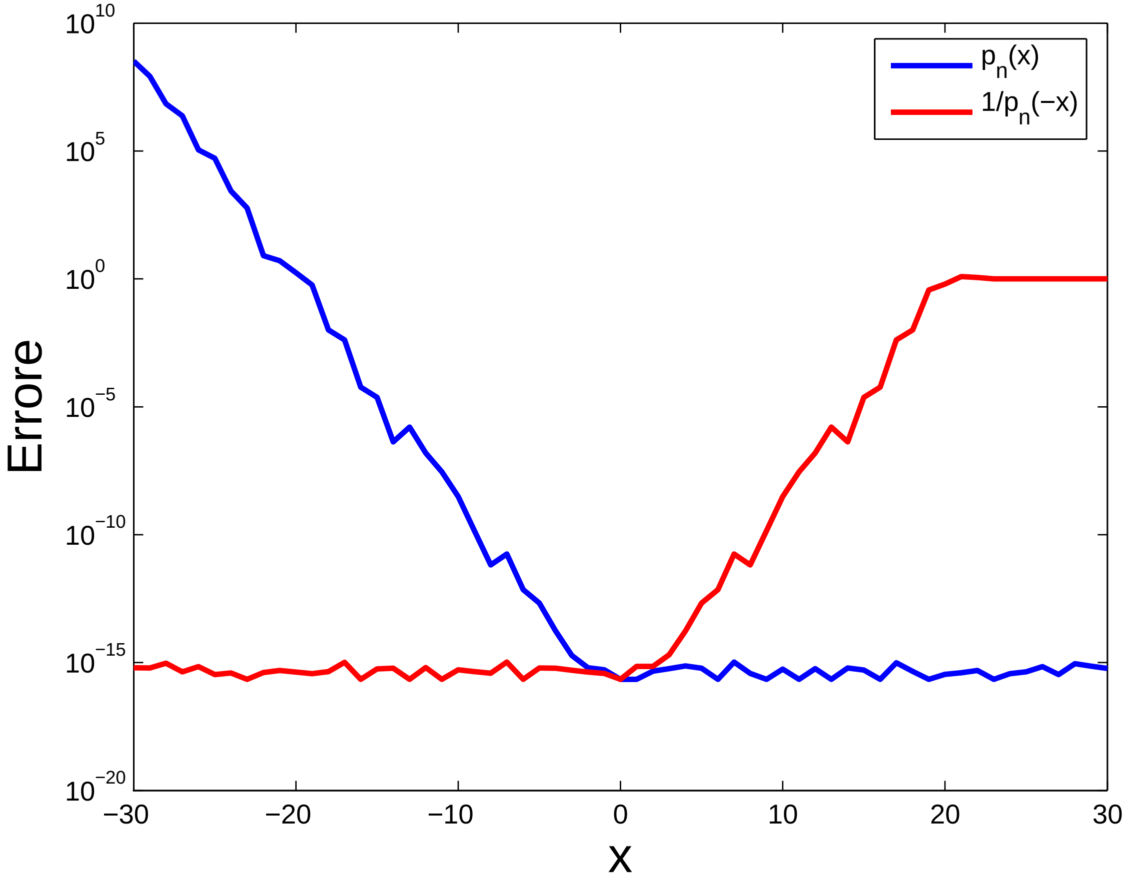
$$r_n(x, x_0) = \frac{f^{(n+1)}(x + \theta x_0)}{(n+1)!}(x - x_0)^{n+1}, \quad \theta \in [0, 1] \quad \text{(Lagrange)}$$

Approssimazione di e^x

$$\exp(x) = \sum_{k=0}^{n} \frac{x^k}{k!} + \varepsilon$$

$$\exp(x) = \frac{1}{\exp(-x)} = \frac{1}{\sum_{k=0}^{n} \frac{(-x)^k}{k!}} + \varepsilon$$

Andamento dell’errore



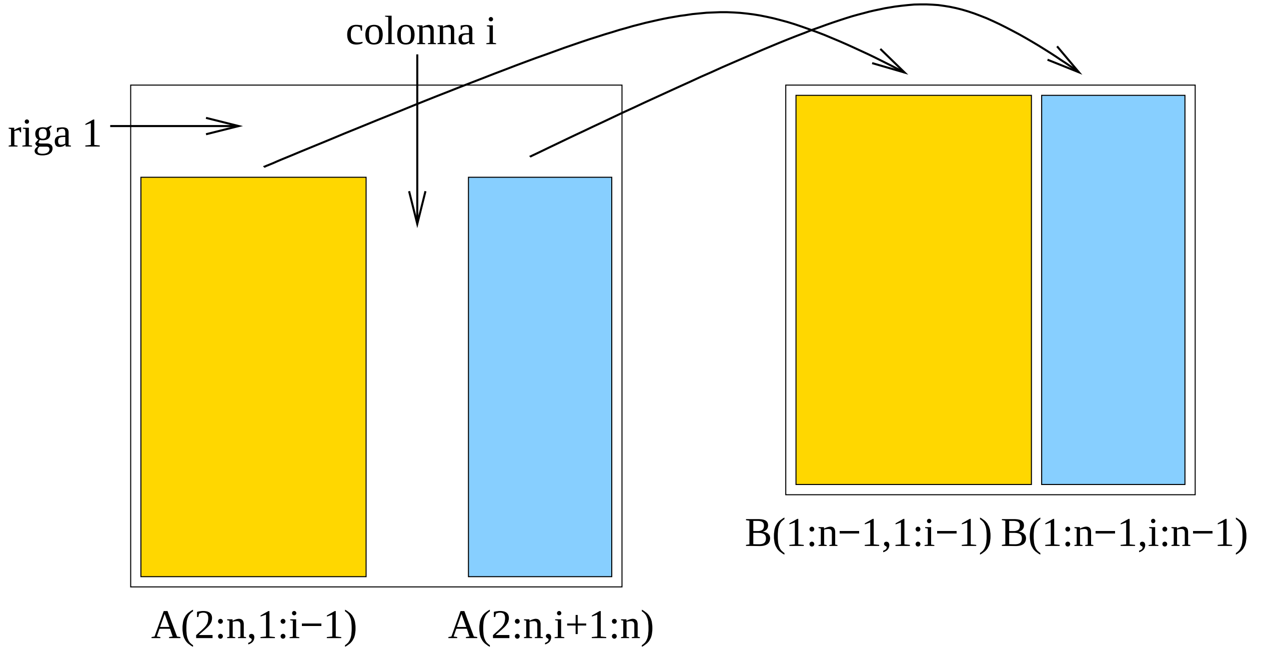
Formula di Laplace

Sviluppo secondo la prima riga

$$\det(A) = \sum_{i=1}^{n} (-1)^{1+i} a_{1i} \det(\widehat{A}^{1i})$$

$\widehat{A}^{1i}$ è ottenuta eliminando la prima riga e la i-sima colonna.

Implementazione



$$B(1 : n - 1, 1 : i - 1) = A(2 : n, 1 : i - 1)$$

$$B(1 : n - 1, i : n - 1) = A(2 : n, i + 1 : n)$$

Matrice test

$$A = \begin{bmatrix} 2 & 1 & 0 & \dots & 0 \\ 1 & 2 & 1 & \ddots & \vdots \\ 0 & 1 & 2 & \ddots & 0 \\ \vdots & \ddots & \ddots & \ddots & 1 \\ 0 & \dots & 0 & 1 & 2 \end{bmatrix}$$

$$\det A = n + 1$$