

Metoda Banachiewicza-Cholesky'ego

A1

$$A = \begin{bmatrix} 27 & 2 & -8 & -7 \\ 2 & 19 & 5 & -6 \\ -8 & 5 & 25 & -5 \\ -7 & -6 & -5 & 23 \end{bmatrix} \quad A = L \cdot L^T \longrightarrow L = ? \quad N = 4$$

$$j := 1 \quad D_j := A_{j,j} \quad \boxed{L}_{j,j} := \sqrt{D_j}$$

$$i := j + 1 \dots N \quad \boxed{L}_{i,j} := A_{i,j} \cdot \frac{1}{L_{j,j}}$$

*i - oznacza nr wiersza,
j - oznacza nr kolumny*

$$j := 2 \quad \boxed{D}_j := A_{j,j} - \sum_{k=1}^{j-1} \left(\boxed{L}_{j,k} \right)^2 \quad \boxed{L}_{j,j} := \sqrt{\boxed{D}_j}$$

$$i := j + 1 \dots N \quad \boxed{L}_{i,j} := \left(A_{i,j} - \sum_{k=1}^{j-1} \left(\boxed{L}_{i,k} \cdot \boxed{L}_{j,k} \right) \right) \cdot \frac{1}{\boxed{L}_{j,j}}$$

$$j := 3 \quad \boxed{D}_j := A_{j,j} - \sum_{k=1}^{j-1} \left(\boxed{L}_{j,k} \right)^2 \quad \boxed{L}_{j,j} := \sqrt{\boxed{D}_j}$$

$$i := j + 1 \dots N \quad \boxed{L}_{i,j} := \left(A_{i,j} - \sum_{k=1}^{j-1} \left(\boxed{L}_{i,k} \cdot \boxed{L}_{j,k} \right) \right) \cdot \frac{1}{\boxed{L}_{j,j}}$$

$$j := 4 \quad \boxed{D}_j := A_{j,j} - \sum_{k=1}^{j-1} \left(\boxed{L}_{j,k} \right)^2 \quad \boxed{L}_{j,j} := \sqrt{\boxed{D}_j}$$

dokładność wyniku: ±0.00005

$$L = \begin{bmatrix} 5.1962 & 0 & 0 & 0 \\ 0.3849 & 4.3419 & 0 & 0 \\ -1.5396 & 1.2881 & 4.5794 & 0 \\ -1.3472 & -1.2625 & -1.1897 & 4.2633 \end{bmatrix} \quad D = \begin{bmatrix} 27 \\ 18.851852 \\ 20.97053 \\ 18.176035 \end{bmatrix}$$

$$W := \text{round} \left(\prod_{i=1}^N D_i \right) = 194011 \quad |A| = W$$