

Metoda Banachiewicza-Cholesky'ego

A2

$$A = \begin{bmatrix} 24 & 2 & -8 & -7 \\ 2 & 20 & 5 & -7 \\ -8 & 5 & 25 & -5 \\ -7 & -7 & -5 & 23 \end{bmatrix} \quad A = L \cdot L^T \longrightarrow L = ? \quad N = 4$$

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

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

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

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

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

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

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

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

dokładność wyniku: ± 0.00005

$$L = \begin{bmatrix} 4.8990 & 0 & 0 & 0 \\ 0.4082 & 4.4535 & 0 & 0 \\ -1.6330 & 1.2724 & 4.5513 & 0 \\ -1.4289 & -1.4408 & -1.2084 & 4.1740 \end{bmatrix} \quad D = \begin{bmatrix} 24 \\ 19.833333 \\ 20.714286 \\ 17.422008 \end{bmatrix}$$

$$W := \text{round} \left(\prod_{i=1}^N D_i \right) = 171781 \quad |A| = W$$