

Metoda Banachiewicza-Cholesky'ego

B2

$$A = \begin{bmatrix} 21 & 2 & -7 & -7 \\ 2 & 19 & 6 & -7 \\ -7 & 6 & 25 & -7 \\ -7 & -7 & -7 & 23 \end{bmatrix} \quad A = L \cdot L^T \longrightarrow L = ? \quad N = 4$$

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

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

*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

$$L = \begin{bmatrix} 4.5826 & 0 & 0 & 0 \\ 0.4364 & 4.3370 & 0 & 0 \\ -1.5275 & 1.5372 & 4.5060 & 0 \\ -1.5275 & -1.4603 & -1.5732 & 4.0074 \end{bmatrix} \quad D = \begin{bmatrix} 21 \\ 18.809524 \\ 20.303797 \\ 16.059352 \end{bmatrix}$$

$$W := \text{round} \left(\prod_{i=1}^N D_i \right) = 128796 \quad |A| = W$$