

Metoda Banachiewicza-Cholesky'ego

B

$$A = \begin{bmatrix} 24 & 1 & 6 & 3 \\ 1 & 15 & -4 & -7 \\ 6 & -4 & 11 & 2 \\ 3 & -7 & 2 & 13 \end{bmatrix} \quad A = L \cdot L^T \longrightarrow L = ? \quad N = 4$$

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

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

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

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

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

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

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

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

dokładność wyniku: ± 0.00005

$$L = \begin{bmatrix} 4.899 & 0 & 0 & 0 \\ 0.2041 & 3.8676 & 0 & 0 \\ 1.2247 & -1.0989 & 2.8797 & 0 \\ 0.6124 & -1.8422 & -0.2689 & 3.0264 \end{bmatrix}$$

$$D = \begin{bmatrix} 24 \\ 14.958333 \\ 8.292479 \\ 9.158885 \end{bmatrix}$$