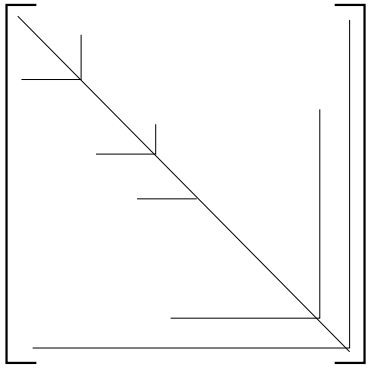
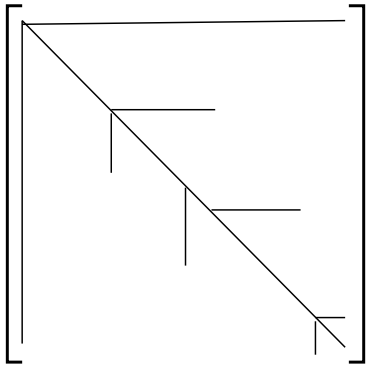
skyline matrices

example of a skyline matrix:



not a skyline matrix:



- sparsity pattern of skyline matrices is inherited by LU-factorization
- $\rightsquigarrow$ know which entries of $\mathbf{L}$, $\mathbf{U}$ are zero $\Longrightarrow$ computational savings
- $\rightsquigarrow$ factors $\mathbf{L}$, $\mathbf{U}$ can be stored in the matrix $\mathbf{A}$

skyline matrices: an example

$$A = \begin{pmatrix} 1 & & & 1 & & & 1 \\ & 1 & & 2 & & & 2 \\ & & 1 & 3 & & & 3 \\ 1 & 2 & 3 & 5 & & & 18 \\ & & & & 1 & & 5 \\ & & & & & 1 & 6 \\ 1 & 2 & 3 & 18 & 5 & 6 & 92 \end{pmatrix}$$

$$L = U^\top = \begin{pmatrix} 1 & & & & & & \\ & 1 & & & & & \\ & & 1 & & & & \\ 1 & 2 & 3 & 1 & & & \\ & & & & 1 & & \\ & & & & & 1 & \\ 1 & 2 & 3 & 4 & 5 & 6 & 1 \end{pmatrix}$$