

Cholesky Algorithm

♣ *Algorithm:* $A \in R^{n \times n}$, $A = LL^t$, A is positive definite and L is lower- Δ .

for $j = 0, 1, \dots, n - 1$

$$L_{jj} \leftarrow \left[A_{jj} - \sum_{k=0}^{j-1} L_{jk}^2 \right]^{1/2}$$

for $i = j + 1, j + 2, \dots, n - 1$

$$L_{ij} \leftarrow \left[A_{ij} - \sum_{k=0}^{j-1} L_{ik} L_{jk} \right] / L_{jj}$$

endfor

endfor

$$A = \begin{bmatrix} 9 & 3 & -3 \\ 3 & 17 & 3 \\ -3 & 3 & 27 \end{bmatrix} = \begin{bmatrix} 3 & 0 & 0 \\ 1 & 4 & 0 \\ -1 & 1 & 5 \end{bmatrix} \begin{bmatrix} 3 & 1 & -1 \\ 0 & 4 & 1 \\ 0 & 0 & 5 \end{bmatrix} = LL^t$$