Método de Crout

$$
\mathrm{Crout}(a,n) := \left|\begin{array}{l}
c \leftarrow a \\
n1 \leftarrow n - 1 \\
n2 \leftarrow n1 - 1 \\
\text{for } I \in 0..n2 \\
\quad \left|\begin{array}{l}
\text{for } i \in I+1..n \\
\quad c_{I,i} \leftarrow \dfrac{c_{I,i}}{c_{I,I}} \\
\text{for } k \in I+1..n1 \\
\quad \text{for } j \in I+1..n \\
\qquad c_{k,j} \leftarrow a_{k,j} - \displaystyle\sum_{J=0}^{I} \left(c_{k,J}\, c_{J,j}\right)
\end{array}\right. \\
c_{n1,n} \leftarrow \dfrac{c_{n1,n}}{c_{n1,n1}} \\
c
\end{array}\right.
$$

$$n := 3 \qquad n1 := n - 1$$

$$a := \begin{pmatrix} 2 & -6 & 8 & 24 \\ 5 & 4 & -3 & 2 \\ 3 & 1 & 2 & 16 \end{pmatrix}$$

$$b := \mathrm{Crout}(a,n)$$

$$b \rightarrow \begin{pmatrix} 2 & -3 & 4 & 12 \\ 5 & 19 & -\dfrac{23}{19} & -\dfrac{58}{19} \\ 3 & 10 & \dfrac{40}{19} & 5 \end{pmatrix}$$

$$U_{n1,n1} := 0 \qquad i := 0..n1 \qquad U_{i,i} := 1 \qquad y := b^{\langle n \rangle}$$

$$
\mathrm{Upper}(b) := \left|\begin{array}{l}
\text{for } i \in 0..n1 \\
\quad \left|\begin{array}{l}
u_{i,i} \leftarrow 1 \\
\text{for } j \in 0..n1 \\
\quad u_{i,j} \leftarrow b_{i,j} \ \text{ if } j > i
\end{array}\right. \\
u
\end{array}\right.
\qquad
\mathrm{Lower}(b) := \left|\begin{array}{l}
\text{for } i \in 0..n1 \\
\quad \text{for } j \in 0..n1 \\
\qquad u_{i,j} \leftarrow b_{i,j} \ \text{ if } i \geq j \\
u
\end{array}\right.
$$

$$U := \mathrm{Upper}(b)$$

$$L := \mathrm{Lower}(b)$$

$$U \rightarrow \begin{pmatrix} 1 & -3 & 4 \\ 0 & 1 & -\dfrac{23}{19} \\ 0 & 0 & 1 \end{pmatrix} \qquad L \rightarrow \begin{pmatrix} 2 & 0 & 0 \\ 5 & 19 & 0 \\ 3 & 10 & \dfrac{40}{19} \end{pmatrix} \qquad L \cdot U \rightarrow \begin{pmatrix} 2 & -6 & 8 \\ 5 & 4 & -3 \\ 3 & 1 & 2 \end{pmatrix}$$

$$
x := \left|\begin{array}{l}
x_{n1} \leftarrow y_{n1} \\
\text{for } i \in n1 - 1..0 \\
\quad x_i \leftarrow y_i - \displaystyle\sum_{k=i+1}^{n1} \left(U_{i,k} \cdot x_k\right) \\
x
\end{array}\right.
$$

$$x \rightarrow \begin{pmatrix} 1 \\ 3 \\ 5 \end{pmatrix}$$