Data: Data $A^{(1)} = A$;
for $k = 1, \dots, n-1$ **do** // costruisco $A^{(2)}$, $A^{(3)}$ eliminando x_2, x_3
  for $i = k+1, \dots, n$ **do** // ciclo sulle righe da $k+1$ all'ultima
    $l_{ik} \leftarrow \dfrac{a_{ik}^{(k)}}{a_{kk}^{(k)}}$; // trovo il moltiplicatore
    for $j = k+1, \dots, n$ **do** // ciclo sulle colonne: le prime k sono 0
      $a_{ij}^{(k+1)} \leftarrow a_{ij}^{(k)} - l_{ik} a_{kj}^{(k)}$; // le altre si trovano sottraendo le righe k
    end
    $b_i^{(k+1)} \leftarrow b_i^{(k)} - l_{ik} b_k^{(k)}$; // uguale sul termine noto
  end
end

ESEMPIO: $A = \begin{bmatrix} 2 & 1 & 1 \\ 4 & 5 & 1 \\ 6 & 1 & 10 \end{bmatrix}$. $A^{(1)} = A$

Data: Data $A^{(1)} = A$;
for $k = 1, \dots, n-1$ **do**
  for $i = k+1, \dots, n$ **do**
    $l_{ik} \leftarrow \dfrac{a_{ik}^{(k)}}{a_{kk}^{(k)}}$;
    for $j = k+1, \dots, n$ **do**
      $a_{ij}^{(k+1)} \leftarrow a_{ij}^{(k)} - l_{ik} a_{kj}^{(k)}$;
    end
    $b_i^{(k+1)} \leftarrow b_i^{(k)} - l_{ik} b_k^{(k)}$;
  end
end

$(k=1)$

$i=2$: $l_{21} \leftarrow \dfrac{a_{21}^{(1)}}{a_{11}} = \dfrac{4}{2} = 2$

$j=2$: $a_{2,2}^{(2)} \leftarrow 5 - 2 \cdot 1 = 3$

$j=3$: $a_{2,3}^{(2)} \leftarrow 1 - 2 \cdot 1 = -1$

$i=3$: $l_{31} \leftarrow \dfrac{a_{31}^{(1)}}{a_{11}} = 3$

$j=2$: $a_{3,2}^{(2)} \leftarrow 1 - 3 \cdot 1 = -2$

$j=3$: $a_{3,3}^{(2)} \leftarrow 10 - 3 \cdot 1 = 7$

$\Rightarrow A^{(2)} = \begin{bmatrix} 2 & 1 & 1 \\ 0 & 3 & -1 \\ 0 & -2 & 7 \end{bmatrix}$

$L = \begin{bmatrix} 1 & 0 & 0 \\ 2 & 1 & 0 \\ 3 & ? & 1 \end{bmatrix}$

$k=2$

$i=3$: $l_{32} \leftarrow \dfrac{a_{32}^{(2)}}{a_{22}} = -\dfrac{2}{3}$

$j=3$: $a_{3,3}^{(3)} = 7 - \left(-\dfrac{2}{3}\right)(-1) = \dfrac{19}{3}$ $\Rightarrow$

$A^{(3)} = U = \begin{bmatrix} 2 & 1 & 1 \\ 0 & 3 & -1 \\ 0 & 0 & 19/3 \end{bmatrix}$

$L = \begin{bmatrix} 1 & 0 & 0 \\ 2 & 1 & 0 \\ 3 & -2/3 & 1 \end{bmatrix}$

Verifica: $L \cdot U = A$

$$\begin{bmatrix} 1 & 0 & 0 \\ 2 & 1 & 0 \\ 3 & -2/3 & 1 \end{bmatrix} \begin{bmatrix} 2 & 1 & 1 \\ 0 & 3 & -1 \\ 0 & 0 & 19/3 \end{bmatrix} = \begin{bmatrix} 2 & 1 & 1 \\ 4 & 5 & 1 \\ 6 & 1 & 10 \end{bmatrix}$$