

$$\underline{p} = [1 \ 2 \ 3 \ 4 \ 5 \ \dots] \Rightarrow p_i = i$$

define the augmented matrix $[a_{ij} \mid b_i]$

initialize p vector $p_i = i$

for $k=1, \dots, n-1$ do: k is the pivot row

find the smallest $j \geq k$ so that $a_{jk} \neq 0$

if no such j exists matrix is not invertible & stop

otherwise exchange $p_k \neq p_j$

ALSO exchange rows $p_k \neq p_j$

for $i \geq k+1$ do:

$$\text{QUOT}(i, k) = a(i, k) / a(k, k)$$

for $j \geq k+1 \dots^{n+1}$ do:

$$\text{set } a(i, j) = a(i, j) - \text{QUOT}(i, k) * a(k, j)$$

$$[a_{ij} \mid b_i] \rightarrow [U_{ij} \mid \tilde{b}_i]$$

$$x_i = [a(i+1, i) - \sum_{j=p_i}^{p_n} a(i, j) * x_j] / a(i, i)$$