+ The system in the exercise is:

How to find S: maximum value of each row in absolute value

$$\underline{a}: \ |^{S^{+}} \text{ row}: \ - | \ | \ 0 \ |^{-3} \longrightarrow abs \ value$$
 is  $\underline{3}$ 

 $2^{\text{rd}}$  row: 1 0 3 1 : max abs is  $\frac{3}{4}$   $3^{\text{rd}}$  row: 0 0 -1 -1: max abs is  $\frac{1}{4}$ 

4th row: (3) 0 12: max abs is 3

Important reminder: this S is "fixed".

Next we start with index vector  $\underline{l} = [1 2 3 4]$ 

Right now we have  $\ell_1 = 1$ ,  $\ell_2 = 2$ ,  $\ell_3 = 3$ ,  $\ell_4 = 4$ 

Later we will see these l, values change!!! ( because we switch the row)

We want BIGGEST: so it is 3 -> meaning 4th row

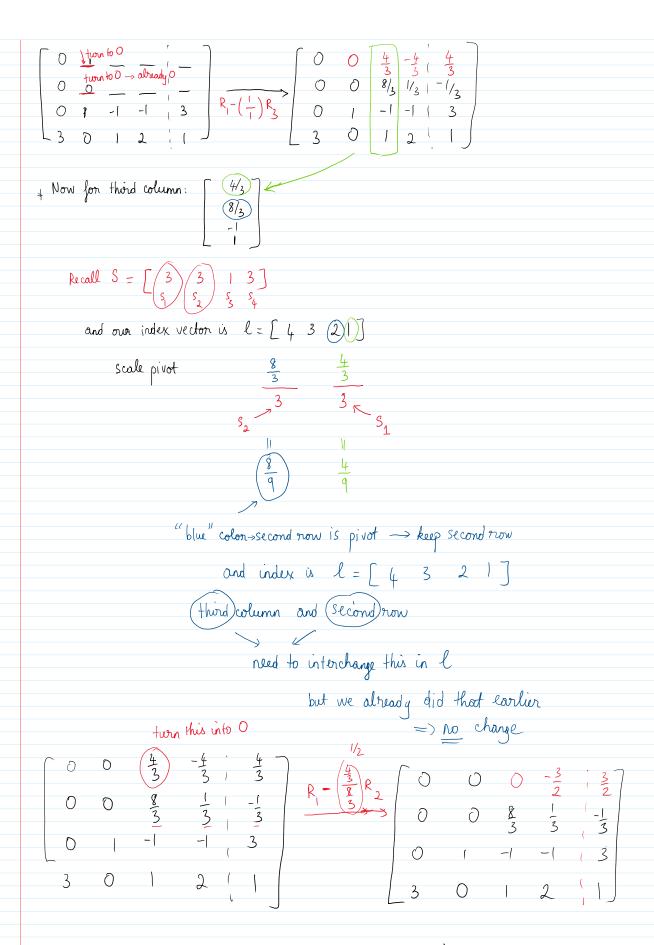
So we will "switch 4" now and [1st row] why 1st?

in the index vector because we are taking l= [4 2 3 1] numbers from 1 st column

Also, we will fix the 4th row and try to turn

the other rows into O (only in the first column) by multipliers how do we get the multipliers: (see the red and blue)  $\begin{bmatrix} -1 & \mathbf{t} & 0 & -3 & 1 & 4 \\ 1 & 0 & 3 & 1 & 0 \\ 0 & 1 & -1 & -1 & 3 \\ 3 & 0 & 1 & 2 & 1 \end{bmatrix} \xrightarrow{R_1 - (-\frac{1}{3})R_4} \begin{bmatrix} 0 & 1 & 1/3 & -7/3 & 13/3 \\ 0 & 0 & 8/3 & 1/3 & -1/3 \\ 0 & 1 & -1 & -1 & 1 & 3 \\ 3 & 0 & 1 & 2 & 1 \end{bmatrix}$ Recall we get the new l=[4321] We fix the  $S = \begin{bmatrix} 3 & 3 & 1 & 3 \end{bmatrix}$ Now we use <u>Second</u> column and divide the S, but do by the order in the [ pay attention to the colores I use]

When we keep third row:



Now you can solve this w/backward substitution => x4 = ...