ONCE ONE HAS... $L = (\cdots M_1 P_1)^{-1}$ with M written under $M_1 P_1$

$$L = M^{-1} = (M_n P_n \cdots)^{-1} \xrightarrow{\text{SIMPLY}} = P_1^T L_1 P_2^T L_2$$

IN EX. 2.16

THEN $A = LU$

BUT WHAT IF ONE WANTS $PA = LU$ NOT $A = LU$?

WE CAN ~~TAKE~~

$$\hat{P} = P_2 P_1 = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 0 & 1 \\ 0 & 1 & 0 \end{bmatrix} \begin{bmatrix} 0 & 1 & 0 \\ 1 & 0 & 0 \\ 0 & 0 & 1 \end{bmatrix} = \begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ 1 & 0 & 0 \end{bmatrix} \xrightarrow[\text{\& SET}]{} L = \begin{bmatrix} 1 & 0 & 0 \\ 1 & 1 & 0 \\ 0.25 & 0.5 & 1 \end{bmatrix}$$

THIS L NOT LOWER TRIANG.

AS L USUALLY WOULD BE

~~ARE~~

$\boxed{\text{CROSS PROD. OF ALL } P \text{ MATRICES}}$

$$\hat{L} = \begin{bmatrix} 1 & 0 & 0 \\ -47/55 & 2/11 & 1 \\ -3/5 & 1 & 0 \end{bmatrix} \longrightarrow L = \text{JUST } m\text{'s} = \begin{bmatrix} 1 & 0 & 0 \\ 3/5 & 1 & 0 \\ 1/5 & -2/11 & 1 \end{bmatrix}$$

CORRECT L IN $PA = LU$

NOW P = CROSS PROD. OF ALL P_n

$$\begin{bmatrix} 1 & 0 & 0 \\ 0 & 0 & 1 \\ 0 & 1 & 0 \end{bmatrix} = P \longrightarrow PA = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 0 & 1 \\ 0 & 1 & 0 \end{bmatrix} \begin{bmatrix} -5 & 2 & 1 \\ 1 & 0 & 3 \\ 2 & 1 & 6 \end{bmatrix} = \begin{bmatrix} -5 & 2 & 1 \\ 2 & 1 & 6 \\ 1 & 0 & 3 \end{bmatrix}$$

$$LU = ? \begin{bmatrix} 1 & 0 & 0 \\ 3/5 & 1 & 0 \\ 1/5 & -2/11 & 1 \end{bmatrix} \begin{bmatrix} -5 & 2 & 1 \\ 0 & 11/5 & 33/5 \\ 0 & 0 & \alpha \end{bmatrix} = \begin{bmatrix} -5 & 2 & 1 \\ -3 & & \\ & & \end{bmatrix}$$

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