More on Permutations

Another example:

$$P = \text{Row 1} \rightarrow \text{Row 2, Row 2} \rightarrow \text{Row 3, Row 3} \rightarrow \text{Row 1 of } I$$

$$= \begin{bmatrix} 0 & 0 & 1 \\ 1 & 0 & 0 \\ 0 & 1 & 0 \end{bmatrix}$$

Then

$$PA = \begin{bmatrix} 0 & 0 & 1 \\ 1 & 0 & 0 \\ 0 & 1 & 0 \end{bmatrix} \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix} = \underbrace{\begin{bmatrix} 7 & 8 & 9 \\ 1 & 2 & 3 \\ 4 & 5 & 6 \end{bmatrix}}_{\text{same row exchanges as in } P}$$

Conclusion: We can do row exchanges by multiplying by a permutation matrix