

OBE (OPERASI BARIS ELEMENTER)

1) $\underline{b_{ij}} \rightarrow$

$$\frac{b_{12}}{b_{21}} \rightarrow$$

2) $\underline{b_i(p)} \rightarrow$

$$\underline{b_2\left(\frac{1}{5}\right)} \rightarrow$$

$$\boxed{1}$$

3) $\underline{b_{ij}(p)} \rightarrow$

$$\underline{b_{21}(-3)} \rightarrow$$

$$\textcircled{b_2} = b_2 + (-3)b_1 \quad \boxed{0}$$

MEN

(I)

→ (II)

(III)

ENTER)

MENCARI MATRIKS INVERS

① $A \cdot A^{-1} = I$

→ ② $(A | I) \xrightarrow{\text{OBE}} (I | A^{-1})$



③ $A^{-1} = \frac{1}{|A|} \cdot \text{adj}(A)$

$$A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix} \rightarrow A^{-1} = ?$$

$$\textcircled{1} (A | I_2) \xrightarrow{\text{OBE}} (I_2 | A^{-1})$$

$$\left[\begin{array}{cc|cc} \textcircled{1} & 2 & 1 & 0 \\ \textcircled{3} & 4 & 0 & 1 \end{array} \right]$$

$$R_{21}(-3)$$

$$\left[\begin{array}{cc|cc} \textcircled{1} & 2 & 1 & 0 \\ \textcircled{2} & -2 & -3 & 1 \end{array} \right]$$

$$R_2(\frac{1}{2})$$

$$\left[\begin{array}{cc|cc} \textcircled{1} & 2 & 1 & 0 \\ \textcircled{1} & 1 & \frac{1}{2} & -\frac{1}{2} \end{array} \right]$$

$$R_{12}(-2)$$

$$\left[\begin{array}{cc|cc} \textcircled{1} & 2 & 1 & 0 \\ \textcircled{1} & 1 & \frac{1}{2} & -\frac{1}{2} \end{array} \right]$$

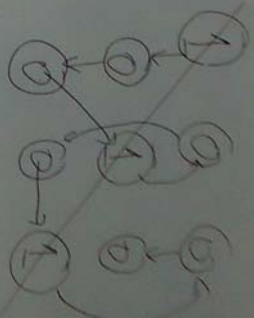
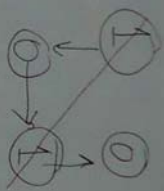
$$A^{-1} = \begin{bmatrix} -2 & 1 \\ \frac{1}{2} & -\frac{1}{2} \end{bmatrix}$$

$$A^{-1} = \begin{bmatrix} -2 & 1 \\ \frac{1}{2} & -\frac{1}{2} \end{bmatrix}$$

$$\textcircled{2} = R_2 + (-3)R_1$$

$$\begin{array}{cc|cc} R_2 : & 3 & 4 & 0 & 1 \\ -3R_1 : & -3 & -6 & -3 & 0 \end{array}$$

$$\textcircled{2} : \begin{array}{cc|cc} 0 & -2 & -3 & 1 \end{array}$$



$$\textcircled{1} = R_1 + (-2)R_2$$

$$\begin{array}{cc|cc} R_1 : & 1 & 2 & 1 & 0 \\ -2R_2 : & 0 & -2 & -3 & 1 \end{array}$$

$$\textcircled{1} : \begin{array}{cc|cc} 1 & 1 & 0 & -2 & 1 \end{array}$$

$$A^{-1} = \begin{bmatrix} -2 & 1 \\ \frac{1}{2} & -\frac{1}{2} \end{bmatrix}$$

$$A = \begin{bmatrix} 2 & 6 & 6 \\ 2 & 8 & 6 \\ 2 & 8 & 8 \end{bmatrix}$$

$$A^{-1} = ?$$

II

$$(A | I_3) \xrightarrow{\text{OBE}} (I_3 | A^{-1})$$

$$A \xrightarrow{+3} \begin{bmatrix} 2 & 6 & 6 & | & 1 & 0 & 0 \\ 2 & 8 & 6 & | & 0 & 1 & 0 \\ 2 & 8 & 8 & | & 0 & 0 & 1 \end{bmatrix}$$

$$\begin{bmatrix} 2 & 6 & 6 & | & 1 & 0 & 0 \\ 2 & 8 & 6 & | & 0 & 1 & 0 \\ 2 & 8 & 8 & | & 0 & 0 & 1 \end{bmatrix} \xrightarrow{R_1(-2)} \begin{bmatrix} 0 & 0 & 0 & | & -1 & 1 & 0 \\ 2 & 8 & 6 & | & 0 & 1 & 0 \\ 2 & 8 & 8 & | & 0 & 0 & 1 \end{bmatrix}$$

$$\begin{bmatrix} 0 & 0 & 0 & | & -1 & 1 & 0 \\ 2 & 8 & 6 & | & 0 & 1 & 0 \\ 2 & 8 & 8 & | & 0 & 0 & 1 \end{bmatrix} \xrightarrow{R_2(-2)} \begin{bmatrix} 0 & 0 & 0 & | & -1 & 1 & 0 \\ 0 & 0 & 0 & | & 1 & -1 & 0 \\ 2 & 8 & 8 & | & 0 & 0 & 1 \end{bmatrix}$$

$$\begin{bmatrix} 0 & 0 & 0 & | & -1 & 1 & 0 \\ 0 & 0 & 0 & | & 1 & -1 & 0 \\ 2 & 8 & 8 & | & 0 & 0 & 1 \end{bmatrix} \xrightarrow{R_3(-2)} \begin{bmatrix} 0 & 0 & 0 & | & -1 & 1 & 0 \\ 0 & 0 & 0 & | & 1 & -1 & 0 \\ 0 & 0 & 0 & | & 0 & 0 & 1 \end{bmatrix}$$

$$R_2 = R_2 + (-2)R_1$$

$$R_2: 2 \ 8 \ 6 \ | \ 0 \ 1 \ 0$$

$$R_3: 2 \ 8 \ 8 \ | \ 0 \ 0 \ 1$$

$$R_2: -2 \ -6 \ -6 \ | \ -1 \ 0 \ 0$$

$$R_3: -2 \ -6 \ -6 \ | \ -1 \ 0 \ 0$$

$$R_2: 0 \ 2 \ 0 \ | \ -1 \ 1 \ 0$$

$$R_3: 0 \ 2 \ 2 \ | \ -1 \ 0 \ 1$$

$$R_3 = R_3 + (-2)R_2$$

$$R_3: 2 \ 8 \ 8 \ | \ 0 \ 0 \ 1$$

$$R_3: -2 \ -6 \ -6 \ | \ -1 \ 0 \ 0$$

$$R_3: 0 \ 0 \ 2 \ | \ 0 \ -1 \ 0$$

$$R_1 = R_1 + (-3)R_2$$

$$R_1: 1 \ 3 \ 3 \ | \ \frac{1}{2} \ 0 \ 0$$

$$R_1: 0 \ -3 \ 0 \ | \ \frac{1}{2} + \frac{1}{2} \ 0 \ 0$$

$$R_1: 1 \ 0 \ 3 \ | \ 2 \ -\frac{1}{2} \ 0$$

$$R_1: 0 \ 0 \ 2 \ | \ 0 \ -1 \ 0$$

$$R_3 = R_3 + (-2)R_2$$

$$R_3: 0 \ 2 \ 2 \ | \ -1 \ 0 \ 1$$

$$R_3: 0 \ 0 \ 0 \ | \ 0 \ -1 \ 0$$

$$\left[\begin{array}{ccc|ccc} 0 & 3 & 2 & -\frac{1}{2} & 0 & 0 \\ 0 & 1 & 0 & -\frac{1}{2} & 0 & 0 \\ 0 & 0 & 0 & -1 & 1 & 0 \end{array} \right]$$

$$R_3 \left(\frac{1}{2} \right)$$

$$\left[\begin{array}{ccc|ccc} 0 & 3 & 2 & -\frac{1}{2} & 0 & 0 \\ 0 & 1 & 0 & -\frac{1}{2} & 0 & 0 \\ 0 & 0 & 1 & 0 & -\frac{1}{2} & \frac{1}{2} \end{array} \right]$$

$$R_{13}(-3)$$

$$\left[\begin{array}{ccc|ccc} 1 & 0 & 0 & 2 & 0 & -\frac{1}{2} \\ 0 & 1 & 0 & -\frac{1}{2} & 0 & -\frac{1}{2} \\ 0 & 0 & 1 & 0 & -\frac{1}{2} & \frac{1}{2} \end{array} \right] \begin{array}{l} I_3 \\ A^{-1} \end{array}$$

$$R_1 = R_1 + (-3)R_3$$

$$R_1: \begin{array}{ccc|ccc} 1 & 0 & 3 & 2 & -\frac{1}{2} & 0 \\ 0 & 0 & -3 & 0 & \frac{1}{2} & -\frac{1}{2} \end{array}$$

$$R_1: \begin{array}{ccc|ccc} 1 & 0 & 0 & 2 & 0 & -\frac{1}{2} \end{array} +$$

$$A^{-1} =$$

$$\begin{pmatrix} 2 & 0 & -\frac{1}{2} \\ -\frac{1}{2} & 0 & -\frac{1}{2} \\ 0 & -\frac{1}{2} & \frac{1}{2} \end{pmatrix}$$


```
A := array([[-1, 0, -2], [0, 1, 1], [1, 0, 1]]);
```

> inverse(A);

$$A := \begin{bmatrix} -1 & 0 & -2 \\ 0 & 1 & 1 \\ 1 & 0 & 1 \end{bmatrix}$$

$$\begin{bmatrix} 1 & 0 & 2 \\ 1 & 1 & 1 \\ -1 & 0 & -1 \end{bmatrix}$$

MATRIKS ESELON

1	2	3	4	5	6
0	1	2	3	4	5
0	0	1	2	3	4
0	0	0	1	2	3
0	0	0	0	1	2
0	0	0	0	0	1
0	0	0	0	0	0
0	0	0	0	0	0

MATRIKS ESELON TEREDUKSI

A handwritten matrix in row echelon form, enclosed in large square brackets. The matrix has 8 rows and 6 columns. A diagonal line is drawn from the top-left to the bottom-right, passing through the circled '1's in the first six rows. The last two rows are enclosed in a separate box and contain only zeros.

1	0	0	0	0	0
0	1	0	0	0	0
0	0	1	0	0	0
0	0	0	1	0	0
0	0	0	0	1	0
0	0	0	0	0	1
0	0	0	0	0	0
0	0	0	0	0	0

$$I_3 = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

$$\xrightarrow{k_{31}} E =$$

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

$$\xrightarrow{k_{13}} I_3 =$$

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

$$I_3 = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

$$\xrightarrow{k_2(5)} E = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 5 & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

$$\xrightarrow{k_2(\frac{1}{5})} I_3 =$$

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

$$I_3 = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

$$\xrightarrow{k_{23}(4)} E =$$

$$\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 4 \\ 0 & 0 & 1 \end{bmatrix}$$

$$\xrightarrow{k_{23}(-4)} I_3 =$$

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

$$\begin{array}{r} k_2 = k_2 + (4)k_3 \\ k_2: \quad 0 \quad 1 \quad 0 \\ k_3: \quad 0 \quad 0 \quad 4 \\ \hline k_2: \quad 0 \quad 1 \quad 4 \end{array}$$

$$\begin{array}{r} k_2 = k_2 + (-4)k_3 \\ k_2: \quad 0 \quad 1 \quad 4 \\ -4k_3: \quad 0 \quad 0 \quad -4 \\ \hline k_2: \quad 0 \quad 1 \quad 0 \end{array}$$

$$I \xrightarrow{R_{ij}} E$$

$$E \cdot A = A \xrightarrow{R_{ij}}$$

$$I_2 = \begin{bmatrix} \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix} \end{bmatrix} \xrightarrow{R_{12} \leftrightarrow R_{21}} E = \begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$$

$$A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$$

$$E \cdot A = \begin{bmatrix} \begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix} \end{bmatrix} \cdot \begin{bmatrix} \begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix} \end{bmatrix} = \begin{bmatrix} 0+3 & 0+4 \\ 1+0 & 2+0 \end{bmatrix}$$

$$= \begin{bmatrix} 3 & 4 \\ 1 & 2 \end{bmatrix}$$

$$A = \begin{bmatrix} \begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix} \end{bmatrix} \xrightarrow{R_{12} \leftrightarrow R_{21}} \begin{bmatrix} 3 & 4 \\ 1 & 2 \end{bmatrix}$$

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MENCARI MATRIKS INVERS

① $A \cdot A^{-1} = I$

→ ② $(A | I) \xrightarrow{\text{OBE}} (I | A^{-1})$



③ $A^{-1} = \frac{1}{|A|} \cdot \text{adj}(A)$

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

$$\left[\begin{array}{ccc|ccc} 1 & 2 & 1 & 0 & 6 & -2 \\ 0 & 1 & \frac{1}{2} & 0 & 1 & -\frac{1}{2} \\ 0 & 0 & 0 & 0 & 0 & 0 \end{array} \right]$$

$$A^{-1} = \begin{pmatrix} -2 & 1 \\ 1/2 & -1/2 \end{pmatrix} \quad I_2 = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$$

$$\textcircled{b_2} = \underline{b_2} + \frac{(-3)b_1}{1}$$

$$\begin{array}{ccc|ccc} & & & 0 & 1 & \\ \text{R}_2 & : & -\text{R}_1 & 4 & 0 & 1 \\ & & & -6 & -3 & 0 \\ \text{R}_3 & : & -\text{R}_1 & -2 & -3 & 1 \\ & & & 0 & 0 & 0 \end{array}$$

$$\begin{array}{ccc|ccc} \textcircled{b_1} & = & \underline{b_1} + (-2)\underline{b_2} & & & \\ \hline b_1 & : & 1 & 2 & 1 & 0 \\ -2b_2 & : & 0 & -2 & -3 & 1 \end{array} \quad \text{f.}$$

$$\begin{bmatrix} 1 & -2 & -1 \\ 1 & -1 & 2 \\ 1 & -2 & -1 \end{bmatrix}$$

$$A = \begin{bmatrix} 2 & 6 & 6 \\ 2 & 8 & 6 \\ 2 & 8 & 8 \end{bmatrix}$$

$$A^{-1} = ?$$

II

$$(A | I_3) \xrightarrow{\text{OBE}} (I_3 | A^{-1})$$

$$A \xrightarrow{+3} \begin{bmatrix} 2 & 6 & 6 & | & 1 & 0 & 0 \\ 2 & 8 & 6 & | & 0 & 1 & 0 \\ 2 & 8 & 8 & | & 0 & 0 & 1 \end{bmatrix}$$

$$\begin{bmatrix} 2 & 6 & 6 & | & 1 & 0 & 0 \\ 2 & 8 & 6 & | & 0 & 1 & 0 \\ 2 & 8 & 8 & | & 0 & 0 & 1 \end{bmatrix} \xrightarrow{R_1(-2)} \begin{bmatrix} 0 & -2 & -4 & | & -1 & 0 & 0 \\ 2 & 8 & 6 & | & 1 & 0 & 0 \\ 2 & 8 & 8 & | & 0 & 0 & 1 \end{bmatrix}$$

$$\begin{bmatrix} 0 & -2 & -4 & | & -1 & 0 & 0 \\ 2 & 8 & 6 & | & 1 & 0 & 0 \\ 2 & 8 & 8 & | & 0 & 0 & 1 \end{bmatrix} \xrightarrow{R_2(-2)} \begin{bmatrix} 0 & -2 & -4 & | & -1 & 0 & 0 \\ 0 & 12 & 14 & | & 1 & 0 & 0 \\ 2 & 8 & 8 & | & 0 & 0 & 1 \end{bmatrix}$$

$$\begin{bmatrix} 0 & -2 & -4 & | & -1 & 0 & 0 \\ 0 & 12 & 14 & | & 1 & 0 & 0 \\ 2 & 8 & 8 & | & 0 & 0 & 1 \end{bmatrix} \xrightarrow{R_3(-2)} \begin{bmatrix} 0 & -2 & -4 & | & -1 & 0 & 0 \\ 0 & 12 & 14 & | & 1 & 0 & 0 \\ 0 & 16 & 16 & | & 0 & 0 & 1 \end{bmatrix}$$

$$R_2 = R_2 + (-2)R_1$$

$$R_2: 2 \ 8 \ 6 \ | \ 0 \ 1 \ 0$$

$$R_3: 2 \ 8 \ 8 \ | \ 0 \ 0 \ 1$$

$$R_1: 0 \ 2 \ 0 \ | \ -1 \ 1 \ 0$$

$$R_3 = R_3 + (-2)R_1$$

$$R_3: 2 \ 8 \ 8 \ | \ 0 \ 0 \ 1$$

$$R_1: 0 \ 2 \ 2 \ | \ -1 \ 0 \ 1$$

$$R_1 = R_1 + (-3)R_2$$

$$R_1: 1 \ 3 \ 3 \ | \ \frac{1}{2} \ 0 \ 0$$

$$R_3: 0 \ 2 \ 2 \ | \ -1 \ 0 \ 1$$

$$R_2: 0 \ -3 \ 0 \ | \ \frac{1}{2} + \frac{1}{2} \ 0 \ 0$$

$$R_3: 0 \ 0 \ 2 \ | \ 0 \ -1 \ 0$$

$$R_3 = R_3 + (-2)R_2$$

$$R_3: 0 \ 2 \ 2 \ | \ -1 \ 0 \ 1$$

$$R_1: 1 \ 0 \ 3 \ | \ 2 \ -\frac{1}{2} \ 0$$

$$\left[\begin{array}{ccc|ccc} 0 & 3 & 2 & -\frac{1}{2} & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} & 0 & 0 \\ 0 & 0 & 0 & -1 & 1 & 0 \end{array} \right]$$

$$R_3 \left(\frac{1}{2} \right)$$

$$\left[\begin{array}{ccc|ccc} 0 & 3 & 2 & -\frac{1}{2} & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} & 0 & 0 \\ 0 & 0 & 0 & -\frac{1}{2} & \frac{1}{2} & 0 \end{array} \right]$$

$$R_{13}(-3)$$

$$\left[\begin{array}{ccc|ccc} 1 & 0 & 0 & 2 & 0 & -\frac{1}{2} \\ 0 & 1 & 0 & -\frac{1}{2} & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 & -\frac{1}{2} & \frac{1}{2} \end{array} \right] \begin{array}{l} I_3 \\ A^{-1} \end{array}$$

$$R_1 = R_1 + (-3)R_3$$

$$R_1: \begin{array}{ccc|ccc} 1 & 0 & 3 & 2 & -\frac{1}{2} & 0 \\ 0 & 0 & -3 & 0 & \frac{1}{2} & -\frac{1}{2} \end{array}$$

$$R_1: \begin{array}{ccc|ccc} 1 & 0 & 0 & 2 & 0 & -\frac{1}{2} \end{array}$$

$$A^{-1} =$$

$$\begin{pmatrix} 2 & 0 & -\frac{1}{2} \\ -\frac{1}{2} & 0 & \frac{1}{2} \\ 0 & -\frac{1}{2} & \frac{1}{2} \end{pmatrix}$$

```

> A := array([[-1,0,-2],[0,1,1],[1,0,1]]);

```

$$A := \begin{bmatrix} -1 & 0 & -2 \\ 0 & 1 & 1 \\ 1 & 0 & 1 \end{bmatrix}$$

```

> inverse(A);

```

$$\begin{bmatrix} 1 & 0 & 2 \\ 1 & 1 & 1 \\ -1 & 0 & -1 \end{bmatrix}$$

MATRIKS ESELON TEREDUKSI

A handwritten matrix in row echelon form, enclosed in large square brackets. The matrix consists of 8 rows and 6 columns. The first six rows each have a leading 1 (circled) in the first, second, third, fourth, fifth, and sixth columns respectively. The last two rows consist entirely of zeros. A diagonal line is drawn from the top-left to the bottom-right, passing through the leading ones. A horizontal line is drawn under the last two rows of zeros.

1	0	0	0	0	0
0	1	0	0	0	0
0	0	1	0	0	0
0	0	0	1	0	0
0	0	0	0	1	0
0	0	0	0	0	1
0	0	0	0	0	0
0	0	0	0	0	0

$$I_3 = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

$$\xrightarrow{k_{31}} E =$$

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

$$\xrightarrow{k_{13}} I_3 =$$

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

$$I_3 = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

$$\xrightarrow{k_2(5)} E =$$

$$\begin{bmatrix} 1 & 0 & 0 \\ 0 & 5 & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

$$\xrightarrow{k_2(\frac{1}{5})} I_3 =$$

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

$$I_3 = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

$$\xrightarrow{k_{23}(4)} E =$$

$$\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 4 \\ 0 & 0 & 1 \end{bmatrix}$$

$$\xrightarrow{k_{23}(-4)} I_3 =$$

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

$$\begin{array}{r} k_2 = k_2 + (4)k_3 \\ \hline k_2: \quad 0 \quad 1 \quad 0 \\ k_3: \quad 0 \quad 0 \quad 4 + \\ \hline k_2: \quad 0 \quad 1 \quad 4 \end{array}$$

$$\begin{array}{r} k_2 = k_2 + (-4)k_3 \\ \hline k_2: \quad 0 \quad 1 \quad 4 \\ -4k_3: \quad 0 \quad 0 \quad -4 + \\ \hline k_2: \quad 0 \quad 1 \quad 0 \end{array}$$

$$I \xrightarrow{R_{ij}} E$$

$$E \cdot A = A \xrightarrow{R_{ij}}$$

$$I_2 = \begin{bmatrix} \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix} \end{bmatrix} \xrightarrow{R_{12} \leftrightarrow R_{21}} E = \begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$$

$$A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$$

$$E \cdot A = \begin{bmatrix} \begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix} \end{bmatrix} \cdot \begin{bmatrix} \begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix} \end{bmatrix} = \begin{bmatrix} 0+3 & 0+4 \\ 1+0 & 2+0 \end{bmatrix}$$

$$= \begin{bmatrix} 3 & 4 \\ 1 & 2 \end{bmatrix}$$

$$A = \begin{bmatrix} \begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix} \end{bmatrix} \xrightarrow{R_{12} \leftrightarrow R_{21}} \begin{bmatrix} 3 & 4 \\ 1 & 2 \end{bmatrix}$$