$A \rightarrow$ La inversa A^{-1}

t.q $AA^{-1} = I$

Inverse Calculation

$$\begin{bmatrix} 2 & 1 & 3 \\ -1 & 2 & 4 \\ 0 & 1 & 3 \end{bmatrix} \begin{bmatrix} a_{00} & a_{01} & a_{12} \\ a_{10} & a_{11} & a_{12} \\ a_{20} & a_{21} & a_{22} \end{bmatrix} = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

$$AA^{-1} = I$$

$$\begin{bmatrix} 2 & 1 & 3 \\ -1 & 2 & 4 \\ 0 & 1 & 3 \end{bmatrix} \begin{bmatrix} a_{00} \\ a_{10} \\ a_{20} \end{bmatrix} = \begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix} \quad \ldots$$

$$\left[\begin{array}{ccc|c} 2 & 1 & 3 & 1 \\ -1 & 2 & 4 & 0 \\ 0 & 1 & 3 & 0 \end{array}\right]$$

$$\left[\begin{array}{ccc|ccc} 2 & 1 & 3 & 1 & 0 & 0 \\ -1 & 2 & 4 & 0 & 1 & 0 \\ 0 & 1 & 3 & 0 & 0 & 1 \end{array}\right] \rightarrow$$

T. Triangular

T. Diagonal

$$\rightarrow \left[\begin{array}{ccc|ccc} 1 & 0 & 0 & C_{00} & C_{01} & C_{02} \\ 0 & 1 & 0 & C_{10} & C_{11} & C_{12} \\ 0 & 0 & 1 & C_{20} & C_{21} & C_{22} \end{array}\right]$$

$$\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} a_{00} & a_{01} & a_{02} \\ a_{10} & a_{11} & a_{12} \\ a_{20} & a_{21} & a_{22} \end{bmatrix} = \begin{bmatrix} C_{00} & C_{01} & C_{02} \\ C_{10} & C_{11} & C_{12} \\ C_{20} & C_{21} & C_{22} \end{bmatrix}$$

$$\begin{bmatrix} a_{00} & a_{01} & a_{02} \\ a_{10} & a_{11} & a_{12} \\ a_{20} & a_{21} & a_{22} \end{bmatrix} = \begin{bmatrix} C_{00} & C_{01} & C_{02} \\ C_{10} & C_{11} & C_{12} \\ C_{20} & C_{21} & C_{22} \end{bmatrix}$$

Determinants Calculation

1) Intercambiar filas $\longrightarrow$ $A \to B$, $\det B = (-1) \det A$
2) Multiplicar por una const $A \to B$, $\det B = c \det A$
3) Reemp. una fila por la suma de la fila más una constante por otra fila $A \to B$, $\det B = \det A$

$$A = \begin{bmatrix} a & b \\ c & d \end{bmatrix} \to \det \begin{vmatrix} a & b \\ c & d \end{vmatrix} = ad - bc$$

1) Intercambiar filas

$$B = \begin{bmatrix} c & d \\ a & b \end{bmatrix} \Rightarrow \det B = bc - ad = (-1)(ad - bc)$$
$$= (-1) \det A$$

2) Multiplico por una const

$$B = \begin{bmatrix} ea & eb \\ c & d \end{bmatrix} \quad \det B = ead - ebc = e(ad - bc)$$
$$= e \det A$$

3)

$$B = \begin{bmatrix} a & b \\ c - ae & d - eb \end{bmatrix} \quad \det B = a(d - eb) - b(c - ae)$$
$$= ad - a\cancel{be} - bc - a\cancel{be}$$
$$= ad - bc = \det A$$

det A

$$\det \begin{bmatrix} a_{00} & a_{01} & a_{12} \\ a_{10} & a_{11} & a_{12} \\ a_{20} & a_{21} & a_{22} \end{bmatrix} = \begin{array}{c} \begin{array}{ccccc} & & - & - & - \end{array} \\ \left[\begin{array}{ccc|cc} a_{00} & a_{01} & a_{12} & a_{00} & a_{01} \\ a_{10} & a_{11} & a_{12} & a_{10} & a_{11} \\ a_{20} & a_{21} & a_{22} & a_{20} & a_{21} \end{array}\right] \\ \begin{array}{ccccc} & & + & + & + \end{array} \end{array}$$

$$A = \begin{bmatrix} a_{00} & a_{01} & a_{12} \\ a_{10} & a_{11} & a_{12} \\ a_{20} & a_{21} & a_{22} \end{bmatrix} \longrightarrow B = \begin{bmatrix} B_{00} & B_{01} & B_{02} \\ 0 & B_{11} & B_{12} \\ 0 & 0 & B_{22} \end{bmatrix}$$

Hago operaciones (1), (3)

d pivoteos $\qquad \det A = (-1)^d \det B$

$$\det \begin{bmatrix} B_{00} & B_{01} & B_{02} \\ 0 & B_{11} & B_{12} \\ 0 & 0 & B_{22} \end{bmatrix} = \begin{array}{c} \begin{array}{ccccc} & & - & - & - \end{array} \\ \begin{bmatrix} B_{00} & B_{01} & B_{02} & B_{00} & B_{01} \\ 0 & B_{11} & B_{12} & 0 & B_{11} \\ 0 & 0 & B_{22} & 0 & 0 \end{bmatrix} \\ \begin{array}{ccccc} & & + & + & + \end{array} \end{array} = \prod_{i=1}^{N} B_{ii}$$

$$= \prod \operatorname{diag}(B)$$

$$\det A = (-1)^d (B_{00} B_{11} B_{22}) = (-1)^d \prod \operatorname{diag}(B)$$