$m, n \in \mathbb{N}$ $\quad (K, +, \cdot)$ campo

$$\mathcal{M}_{m\times n}(K) = \{A \mid A \text{ matrice di tipo } m \times n \text{ su } K\}$$

Se $m = n$, $\mathcal{M}_n(K)$ si dice spazio delle matrici quadrate di ordine n.

Operazioni:

$\boxplus$:
$$\mathcal{M}_{m\times n}(K) \times \mathcal{M}_{m\times n}(K) \longrightarrow \mathcal{M}_{m\times n}(K)$$

$$\left(\begin{pmatrix} a_1^1 & \cdots & a_n^1 \\ \vdots & & \\ a_1^m & \cdots & a_n^m \end{pmatrix}, \begin{pmatrix} b_1^1 & \cdots & b_n^1 \\ \vdots & & \\ b_1^m & \cdots & b_n^m \end{pmatrix} \right) \longrightarrow \begin{pmatrix} a_1^1 + b_1^1 & \cdots & a_n^1 + b_n^1 \\ \vdots & & \\ a_1^m + b_1^m & \cdots & a_n^m + b_n^m \end{pmatrix}$$

$\boxdot$:
$$K \times \mathcal{M}_{m\times n}(K) \longrightarrow \mathcal{M}_{m\times n}(K)$$

$$\left(\alpha, \begin{pmatrix} a_1^1 & \cdots & a_n^1 \\ \vdots & & \\ a_1^m & \cdots & a_n^m \end{pmatrix} \right) \longrightarrow \begin{pmatrix} \alpha \cdot a_1^1 & \cdots & \alpha \cdot a_n^1 \\ \vdots & & \\ \alpha \cdot a_1^m & \cdots & \alpha \cdot a_n^m \end{pmatrix}$$

Esempio:

$$A = \begin{pmatrix} 2 & 3 \\ -7 & 5 \end{pmatrix} \qquad \alpha = -4 \qquad B = \begin{pmatrix} -2 & 1 \\ 0 & 3 \end{pmatrix}$$

$$\alpha \cdot A = \begin{pmatrix} -8 & -12 \\ 28 & -20 \end{pmatrix}$$

NB: + e · sono le operazioni usuali

$$A + B = \begin{pmatrix} 0 & 4 \\ -7 & 8 \end{pmatrix}$$