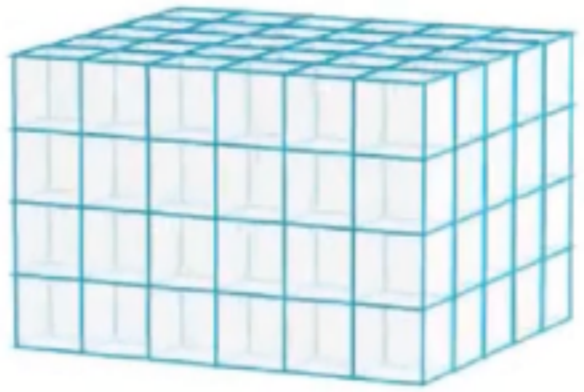
Matrix Code Equivalence

3-tensor

Can think of a matrix code as a 3-tensor over $\mathbb{F}_q$

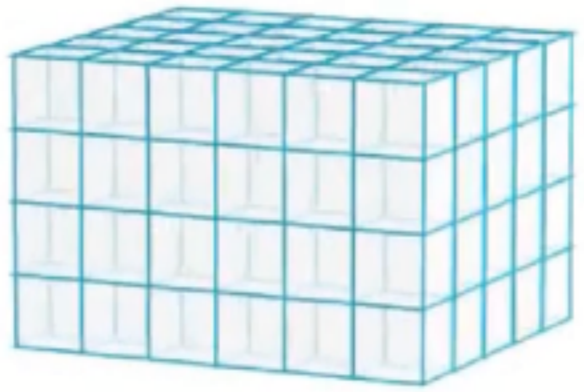
Equivalence then becomes *tensor isomorphism*

$\mathscr{C} \subseteq \mathbb{F}_q^{m \times n \times k}$



TODO: ANIMATION

$\mathscr{D} \subseteq \mathbb{F}_q^{m \times n \times k}$



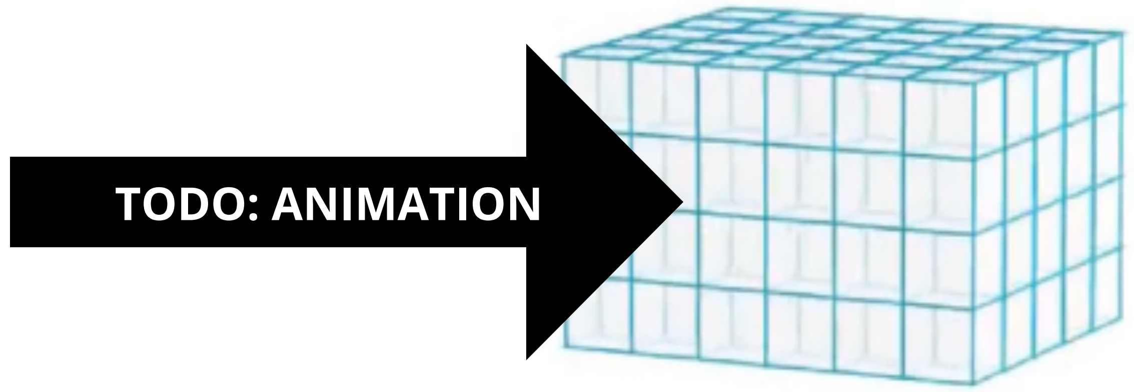
Matrix Code Equivalence

symmetry

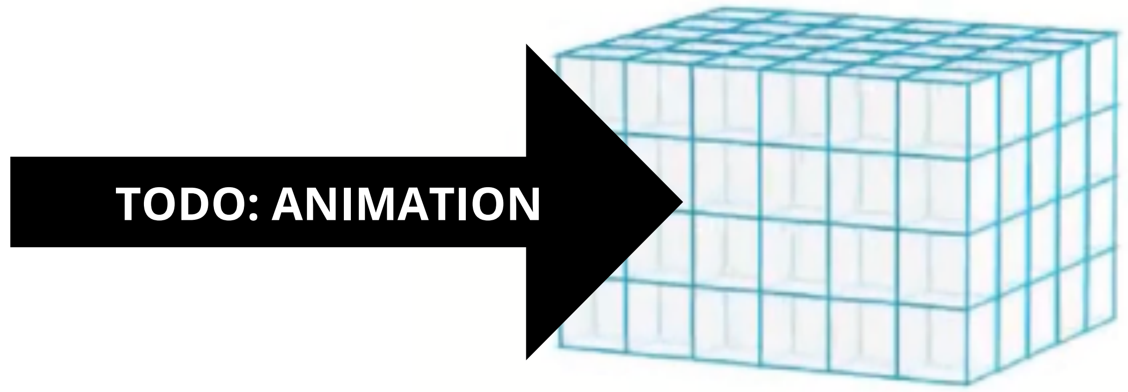
Viewed as a 3-tensor, we can see $\mathscr{C}$ from three directions

- an k-dimensional code in $\mathbb{F}_q^{m\times n}$
- an m-dimensional code in $\mathbb{F}_q^{n\times k}$
- an n-dimensional code in $\mathbb{F}_q^{m\times k}$

$$\mathscr{C} \subseteq \mathbb{F}_q^{m\times n\times k}$$



$$\mathscr{C} \subseteq \mathbb{F}_q^{m\times n\times k}$$



$$\mathscr{C} \subseteq \mathbb{F}_q^{m\times n\times k}$$