Definition (Coproduct)**.** Let $\mathbf{C}$ be a category and let $X, Y \in \mathrm{Ob}_{\mathbf{C}}$ be objects. The *coproduct* of X and Y is:

Constituents

1. an object $Z \in \mathrm{Ob}_{\mathbf{C}}$ ("the coproduct" of X and Y)
2. *injection morphisms* $\iota_1 : X \to Z$ and $\iota_2 : Y \to Z$

Conditions

1. For any $T \in \mathrm{Ob}_{\mathbf{C}}$ and any morphisms $f : X \to T, g : Y \to T$, there exists a *unique* morphism $\psi_{f,g} : Z \to T$ such that $f = \iota_1 \fatsemi \psi_{f,g}$ and $g = \iota_2 \fatsemi \psi_{f,g}$.