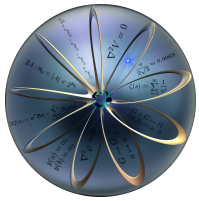

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categorical direct sum

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Let $\{C_i\}_{i\in I}$ be a set of objects in a category $\mathcal{C}$. A *direct sum* of the collection $\{C_i\}_{i\in I}$ is an object $\coprod_{i\in I} C_i$ of $\mathcal{C}$, with morphisms $\iota_i : C_i \longrightarrow \coprod_{j\in I} C_j$ for each $i \in I$, such that:

For every object A in $\mathcal{C}$, and any collection of morphisms $f_i : C_i \longrightarrow A$ for every $i \in I$, there exists a unique morphism $f : \coprod_{i\in I} C_i \longrightarrow A$ making the following diagram commute for all $i \in I$.