

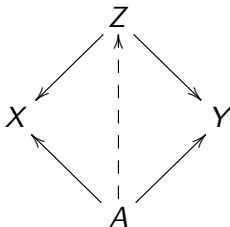
Product

Let \mathcal{C} be a category. Let X, Y be two objects in \mathcal{C} . Consider the functor

$$F: \mathcal{C}^{\text{op}} \rightarrow \mathbf{Set}$$

sending A to $\text{Mor}_{\mathcal{C}}(A, X) \times \text{Mor}_{\mathcal{C}}(A, Y)$.

Suppose that F is representable; $F \xrightarrow{\sim} h_Z$ for some Z . Then, $1_Z \in h_Z(Z)$ corresponds to a pair of morphisms $Z \rightarrow X$ and $Z \rightarrow Y$. Yoneda's lemma tells us that it satisfies the universal property;



In other words, Z is the 'product' of X and Y .

Question

Can you interpret disjoint union in a categorical way? The result is called 'coproduct'.