

Definition (Kleisli category)

Let $\langle M, \mu, \eta \rangle$ be a monad on a category \mathbf{C} . The *Kleisli category* \mathbf{C}_M of the monad M is specified by:

1. *Objects*: $\mathbf{Ob}(\mathbf{C}_M) := \mathbf{Ob}(\mathbf{C})$;
2. *Morphisms*: $\mathbf{Hom}_{\mathbf{C}_M}(X, Y) := \mathbf{Hom}_{\mathbf{C}}(X, M(Y))$;
3. *Identities*: $\text{Id}_X := \eta_X$;
4. *Composition*: Kleisli composition.