Definition (Kleisli category)

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

1. *Objects*: $\mathrm{Ob}(\mathbf{C}_M) := \mathrm{Ob}(\mathbf{C})$;

2. *Morphisms*: $\mathrm{Hom}_{\mathbf{C}_M}(X, Y) := \mathrm{Hom}_{\mathbf{C}}(X, M(Y))$;

3. *Identities*: $\mathrm{Id}_X := \mathrm{un}_X$;

4. *Composition*: Kleisli composition.