

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

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