

**Definition 1.** Functors map between categories while respecting composition and identity.

$$F : C \rightarrow D$$

$$F : \text{obj}(C) \rightarrow \text{obj}(D)$$

$$F : \text{hom}(C) \rightarrow \text{hom}(D)$$

$$A \xrightarrow{f} B$$

$$F(A) \xrightarrow{F(f)} F(B)$$