

# Special morphisms

Let  $f$  be a morphism of a partially ordered dagger category.

$f$  is *monovalued* when  $f \circ f^\dagger \sqsubseteq 1_{\text{Dst } f}$ .

$f$  is *entirely defined* when  $f^\dagger \circ f \sqsupseteq 1_{\text{Src } f}$ .

$f$  is *injective* when  $f^\dagger \circ f \sqsubseteq 1_{\text{Src } f}$ .

$f$  is *surjective* when  $f \circ f^\dagger \sqsupseteq 1_{\text{Dst } f}$ .

It's easy to show that this is a generalization of monovalued, entirely defined, injective, and surjective binary relations as morphisms of the category **Rel**.