Definition (U endofunctor). The U endofunctor has the form U: Pos \to Pos and acts on objects and morphisms as follows:

- 1. On objects: Given a poset $P \in Ob_{Pos}$, U maps P to its upper set.
- {bhfn:1}
- 2. *On morphisms*: Given posets P, Q, and a monotone map $f: P \to Q$, the U endofunctor acts as:

$$U(f): \mathcal{U}\mathbf{P} \to \mathcal{U}\mathbf{Q}$$

$$\mathbf{P'} \mapsto \mathbf{1} \left(\bigcup_{p \in \mathbf{P'}} \{f(p)\} \right).$$