

Definition (Min)

$\text{Min} : \mathcal{P} \mathbf{P} \rightarrow \mathcal{A} \mathbf{P}$ is the map that sends a subset \mathbf{A} of a poset to the minimal elements of that subset (those elements $a \in S$ such that $a \leq_{\mathbf{P}} b$ for all $b \in \mathbf{A}$).
In formulas:

$$\text{Min} : \mathcal{P} \mathbf{P} \rightarrow \mathcal{A} \mathbf{P}$$

$$\mathbf{A} \mapsto \{c \in \mathbf{A} : (d \in \mathbf{A}) \wedge (d \leq_{\mathbf{P}} c) \Rightarrow (c = d)\}.$$

Note that $\text{Min}(\mathbf{A})$ could be empty.