

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

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

$$S \mapsto \{x \in S : (y \in S) \wedge (y \leq_{\mathbf{P}} x) \Rightarrow (x = y)\}.$$

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