Definition (Min)

Min : $\mathscr{P}\,\mathbf{P} \to \mathcal{A}\mathbf{P}$ 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 $a \preceq_{\mathbf{P}} b$ for all $b \in \mathbf{A}$). In formulas:

$$\begin{aligned} \text{Min} : \mathscr{P}\,\mathbf{P} &\to \mathcal{A}\mathbf{P} \\ \mathbf{A} &\mapsto \{c \in \mathbf{A} : (d \in \mathbf{A}) \wedge (d \preceq_{\mathbf{P}} c) \Rightarrow (c = d)\}. \end{aligned}$$

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