Definition (Preorder). A *preorder* is a tuple $\langle \mathbf{P}, \leq_{\mathbf{P}} \rangle$, where **P** is a set (also called the *carrier set*), together with a relation $\leq_{\mathbf{P}}$ that is

- 1. Reflexive: For all $x \in \mathbb{P}$, $x \leq_{\mathbb{P}} x$.
- 2. Transitive: For all $x, y, z \in \mathbf{P}$, if $x \leq_{\mathbf{P}} y$ and $y \leq_{\mathbf{P}} z$, then $x \leq_{\mathbf{P}} z$.