$f : D_1 \to D_2$ is *monotonic* iff $f(d) \sqsubseteq_{D_2} f(d')$ for all $d \sqsubseteq_{D_1} d'$
$\{d_1, d_2, \ldots\}$ is a *chain* iff $d_1 \sqsubseteq d_2 \sqsubseteq d_3 \sqsubseteq \ldots$

$\{\text{fact}_0, \text{fact}_1, \ldots\}$ is a chain where

$$\begin{aligned}
\text{fact}_0(x) &= \bot \text{ for all } x \in \mathbb{Z}_\bot \\
\text{fact}_1(x) &= \begin{cases} x!, & \text{for } 0 \le x < 1 \\ 1, & \text{for } x < 0 \\ \bot, & \text{for } x = \bot \text{ or } 1 \le x \end{cases} \\
\text{fact}_2(x) &= \begin{cases} x!, & \text{for } 0 \le x < 2 \\ 1, & \text{for } x < 0 \\ \bot, & \text{for } x = \bot \text{ or } 2 \le x \end{cases} \\
&\vdots
\end{aligned}$$

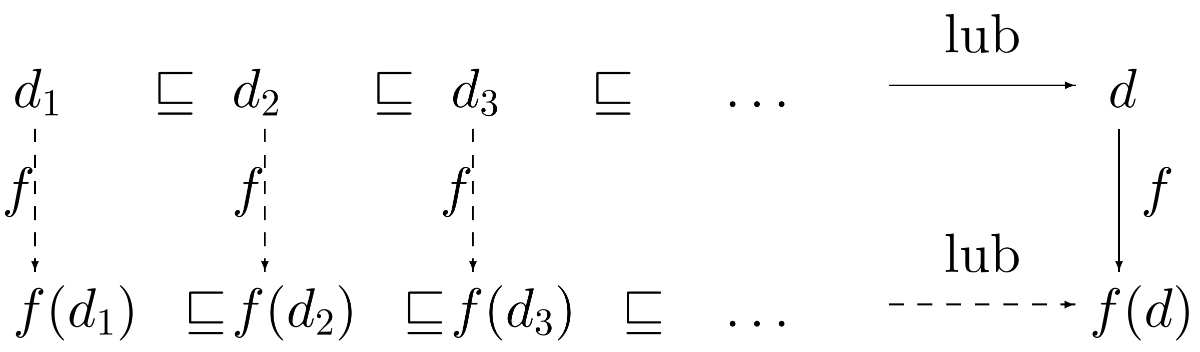
Least upper bound: $\sqcup\{\text{fact}_0, \text{fact}_1, \text{fact}_2, \ldots\} = \text{fact}$ with

$$\text{fact}(x) = \begin{cases} x!, & \text{for } 0 \le x \\ 1, & \text{for } x < 0 \\ \bot, & \text{for } x = \bot \end{cases}$$

A reflexive partial ordering $\sqsubseteq$ on a set D is *complete* iff

(1) D has a smallest element $\bot_D$

(2) every chain S of D has a least upper bound $\sqcup S \in D$



$f : D_1 \to D_2$ is *continuous* if $f(\sqcup S) = \sqcup f(S)$ for every chain S of D_1.

f is *continuous* $\Rightarrow$ f is *monotonic*

$\sqsubseteq$ is a cpo on:

- Base Domains $\mathbb{Z}_\bot$, $\mathbb{B}_\bot$, $C_\bot$, $F_\bot$
- Product Domains $D_1 \times \ldots \times D_n$
- Function Domains $\langle D_1 \to D_2 \rangle$ (*continuous* functions)