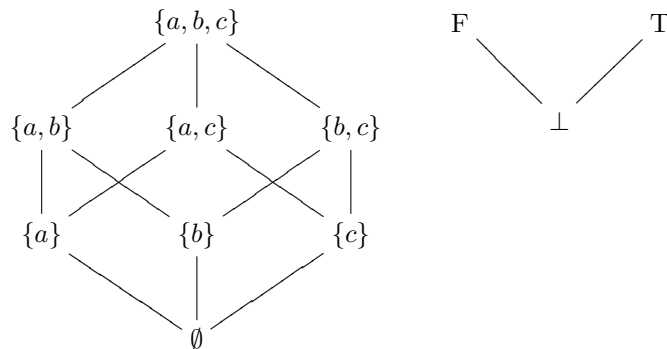


Denotational Semantics

In-class Exercise

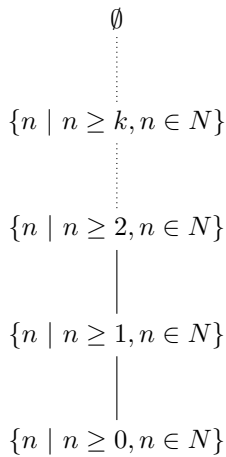
July 6, 2010

1. Show that if both D and D' are domains, then $D \oplus D'$ is a domain.
2. Let domain $D = \{S \mid S \text{ is a subset of } \{a, b, c\}\}$ and domain $\mathcal{B} = \{\perp, F, T\}$. They are illustrated below:



Give an illustration of the domain $D \otimes \mathcal{B}$.

3. Let $N = \{0, 1, 2, \dots\}$ be the set of all natural numbers. Let $X = \{N - \{0, 1, \dots, n - 1\} \mid n \in N\} \cup \{\emptyset\}$ be a poset with $P \sqsubseteq Q$ if and only if $Q \subseteq P$. X is illustrated below:



- (a) Show that X is a domain.
- (b) Show that there is a monotonic function from domain X to domain $\mathcal{Z} = \{\perp, \top\}$ but is not continuous.