

Lemma (Kleene's fixed-point theorem [davey02]). Assume \mathbf{P} is a CPO, and $f : \mathbf{P} \rightarrow \mathbf{P}$ is Scott continuous. Then the least fixed point of f is the supremum of the Kleene ascent chain

$$\perp \leq f(\perp) \leq f(f(\perp)) \leq \cdots \leq f^{(n)}(\perp) \leq \cdots.$$