Problem 4.1
Show that the following proposition holds under the Weak Completion Semantics:

**Proposition 5** If $I \models \text{wc} \mathcal{P}$ then $I \models \mathcal{P}$.

Does the other direction, If $I \models \mathcal{P}$ then $I \models \text{wc} \mathcal{P}$, hold as well? Motivate your answer.

Problem 4.2
Show that the following proposition holds:

**Proposition 6** Every continuous mapping is monotonic.

Does the other direction hold? Motivate your answer.

Problem 4.3
Show that the following lemma holds:

**Lemma 10** Let $X$ be a directed set and $Y$ be a finite subset of $X$. Then $X$ contains an upper bound of $Y$.

Problem 4.4
Show that the following proposition holds:

**Proposition 12** Let $C$ be a finite complete partial order and $f$ a monotonic mapping on $C$. Then $f$ is continuous.