Tutorials for "Formal methods for Java"
Exercise sheet 11

Exercise 1: Soundness of all-left

Prove soundness of the rule `all-left`. Assume $\Gamma, \forall X.\ \phi(X), \phi(t) \Longrightarrow \Delta$ is a tautology and show that $\Gamma, \forall X.\ \phi(X) \Longrightarrow \Delta$ holds in an arbitrary structure $\mathcal{M}$.

Exercise 2: Hintikka Set

Show that H as depicted on Slide 8 from Lecture 22 is a Hintikka set. Restrict yourself to the rules for $\phi \wedge \psi$, $\neg(\phi \wedge \psi)$, $\forall X.\ \phi(X)$ and $\neg(\forall X.\ \phi(X))$.

Hint: First show that if $\neg\phi \in H$, then $\phi \in \Delta$.

Exercise 3: Models for Hintikka Sets

Prove the induction step from Slide 11 of Lecture 22 for the formulas $\phi \rightarrow \psi$, and $\forall X.\ \phi(X)$.