

# Homework # 12

## due May 20, 13:00

Please turn in your written evaluation (§2) at lecture, and email your mechanization (§3) to `scmalte@inf.ethz.ch`.

### 1 Reading

Please read Chapters 26 and 28 in your textbook.

### 2 Comparison

The type system  $F_{\leq}$  described in these chapters is the subject of the “POPLMark” challenge<sup>1</sup>. SASyLF is not yet powerful enough to solve all aspects of the challenge, but the examples directory in the distribution package (or on the Google code site) includes a solution to problem 2a which is a proof of type soundness of  $F_{\leq}$ . (For this reason, you will not be proving type soundness of  $F_{\leq}$  for this assignment!)

Compare one of the submitted solutions to problem 2a with the SASyLF solution. Try to find one that is either familiar (if you know Coq, there are several Coq solutions) or at least well-explained. Use the “Evaluation Criteria” of Section 2.2 of the POPLMark paper.

### 3 Mechanization

Continue your mechanization from Homework #10 and prove a theorem (or central lemma). You are allowed and expected to state and leave unproved any lemmas that this theorem needs. If the theorem is simply a corollary of a lemma, that lemma should be proved too, of course. Please explain everything you do, especially any omissions or changes.

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<sup>1</sup>“Mechanized Metatheory for the Masses: The POPLMARK Challenge” by Brian E. Aydemir and others, 2005