

Homework # 12

due Tuesday, December 6

1 Reading

Please read Chapter 22 in your textbook.

2 Problems

Please do the following problems:

- Exercise 22.2.3
- Exercise 22.3.3
- Exercises 22.4.3
Check your answers against the solution in the book; do not turn them in.
- Exercise 22.5.2

3 Proofs

Prove that constraint type checking is total and sound using the SASyLF definitions and skeleton provided. We will not prove completeness for this homework. Finishing the totality theorem is easy, the soundness theorem is difficult.

You will need to use SASyLF 1.0.2 (uwm 16) or later. The newest change is the addition of `and` judgments. Look at the `and.slf` file in the examples directory, and in `$CLASSHOME/src/homework12`.

4 Extra

Optionally, prove the variable substitution lemma used in the proof of soundness. Only attempt this part if you complete the main proof.

5 Graduate Students

Find two “constraint-based” type systems in the literature. Cite them. What forms do the constraints take? Are proofs given for totality, soundness and completeness? Explain!