Homework # 5
due October 7

1 Reading

Please read Chapter 8 in your textbook.

2 Discussion

The rule E-PredSucc has a condition above the line. (In the book, this condition is hidden by using \texttt{nv} below the line. In the SASyLF version, it’s written as an explicit condition above the line.) What happens if we remove this condition? Can we still prove progress and preservation? Explain!

The rule T-Pred has a condition above the line. What happens if we remove this condition? Can we still prove progress and preservation? Explain! Turn in your answers to this section on paper.

(You might find it helpful to try out what happens using the SASyLF proofs of program and preservation.)

3 Problems

Please do the following problems from the book:

8.3.5, 8.3.6 (p98)

Do not turn in answers; check against back of book.

4 Proofs

Do the following exercises in SASyLF: 8.3.2 (rewrite in SASyLF using “or”) and 8.3.4. Put proofs in homework5.slf in the provided git repo. I have started the file for you.

Optionally: you can do 8.2.3 (you will need to define what it means to be a subterm), as a makeup for a SASyLF section from a previous homework. In other words, it will replace the SASyLF portion of a prior homework.

5 Graduate Students

Find three papers in the literature (recent conferences or journals in programming languages) that prove progress and preservation (or “subject reduction”). What sort of errors are excluded by each system? Give the URL and the list of errors that are avoided.