CS 578 PL Semantics Homework 4 – due 4:40pm, Tuesday, Apr. 30, 2022

You should do all problems, but only those marked with an asterisk (*) must be submitted. (You may submit the others for feedback if you wish.)

Solutions may be submitted on paper at start of class, or by email before class.

Preparing your submission using latex is strongly suggested, but if your handwriting is sufficiently legible, hand-written submissions are also acceptable.

Email solutions should be sent to `tolmach@pdx.edu`, with the subject line "CS578 HW4" and one `.pdf` file as a simple attachment. (If your solution is handwritten, you must scan or photograph it, and produce `.pdf` for submission.) **Please include the code you write for problem 2 within the `.pdf` file, rather than submitting a separate `.ml` file.**

All programs mentioned can be downloaded via the course web page; the relevant code for this assignment is in the `letexercise` and `fullsimple` directories.

* 1. Do Pierce 11.4.1. Do part 1 only. Present a careful and detailed proof. Note the errata for Thm. 11.3.1.

* 2. Do Pierce 11.5.1.

3. Do Pierce 11.9.1.

4. Do Pierce 11.11.1. Use natural numbers as introduced in Chapter 3, assuming they form a type `Nat` with the obvious typing rules.

5. Do Pierce 11.12.1. Develop informal proofs first, before filling in all the details.

6. Do Pierce 11.12.2.