

## CS 510 Semantics & Types Homework 1 – due noon, Thursday, Jan. 17, 2008

Homework must be submitted on paper in class. You are strongly encouraged, though not required, to typeset your solutions using `latex`. The problem marked (Coq) is optional; no need to submit a solution. All programs mentioned can be downloaded via the course web page.

1. Do Pierce 3.5.10.
2. Do Pierce 3.5.13.
3. Do Pierce 3.5.14. Use structural induction on `t`.
4. Do Pierce 3.5.17. Just do one direction (“if” or “only if”) – take your pick!
5. Write and test an OCAML function

```
size : term -> int
```

that implements definition 3.3.2. It will be easiest to put this in file `syntax.ml` and change `main.ml` to print out the size of each input term. Submit just the code for the `size` function.

6. Do Pierce 4.2.2. Just change the implementation of the `eval` function in `core.ml`. If no big-step rule applies, raise the `NoRuleApplies` exception; unlike in the small-step case, this should *not* be caught, but should instead propagate to the top level. Submit your changed `core.ml` file.

(Coq) 7. Follow the `CoqIntro.v` tutorial at least up through “Lab 4.”