

91.301, Organization of Programming Languages  
Fall 2007, Prof. Yanco

### **Problem Set 10: The Metacircular Evaluator**

Out: Tuesday, 4 December 2007

Due: Thursday, 13 December 2007

Note: Due to the end of classes, no late assignments will be accepted.

*Overview:* In this problem set, you'll make modifications to the metacircular evaluator, changing UML Scheme.

To run the metacircular evaluator, download `mceval-with-let.ss` from the course web site. Use the MzScheme language in DrScheme.

After executing the code, evaluate `(mc-eval-loop)`. This will run the interactions for your metacircular UML Scheme world. Remember that everything you type in (except for variables and numbers) should be prefixed by `"uml:"` – if you forget, the system will have an error. If you type in an error, the driver-loop exits and you will lose the state you had in the metacircular world.

You only need to turn in the portions of the code that you change.

**Warm-up:** Run the metacircular evaluator and evaluate some UML Scheme expressions. Nothing to turn in for this part.

**Problem 1:** Exercise 4.4 (“or” only) on p. 374. Remember to tag your new “or” with `"uml:"`.

**Problem 2:** Exercise 4.1 on p. 368.

**Problem 3:** Exercise 4.5 on p. 375.

**Problem 4:** Exercise 4.8 on p. 376. Note that `uml:let` has already been added to the metacircular evaluator in the `mceval-with-let.ss` file.

**Problem 5:** Exercise 4.10 on p. 376. Choose your own way to change UML Scheme's syntax in some non-trivial way (e.g., adding a few more Scheme primitives to the primitives list is trivial, while adding a new statement type is not). For this problem, explain what you did as well as turning in the code.