91.301, Organization of Programming Langauges
Spring 2006, Prof. Yanco

Problem Set 10: The Metacircular Evaluator

Out: Thursday, 27 April 2006
Due: Tuesday, 9 May 2006
Note: Due to the end of classes, no late assignments will not 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.ss from the course web site. Use the MzScheme language in DrScheme.

After executing the code, evaluate `(driver-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 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:

Change uml:if to the following syntax:

```
(uml:if <predicate> uml:then <consequent> uml:else <alternative>)
```

Problem 3:

Add `uml:list` to the metacircular evaluator. It should be a derived expression, meaning that you should convert the `uml:list` expression into a series of `uml:cons` expressions, with a `nil` at the end (`nil`, like `true` and `false`, are added to the global environment when `setup-environment` is evaluated and its value defined as `the-global-environment`). Hint: remember that `uml:cond` was also a derived expression; it was converted to a sequence of `uml:if` statements.

Problem 4:

Exercise 4.10 on p. 376. Choose your own way to change UML Scheme's syntax. For this problem, explain what you did as well as turning in the code.