

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

Problem Set 10: The Metacircular Evaluator

Out: Tuesday, 24 April 2007

Due: Tuesday, 8 May 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.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.