

CMSI 585
PROGRAMMING LANGUAGES (GRADUATE LEVEL)
Fall 2006

Assignment 1128 (or submit on 1121 for a Happy Thanksgiving)

This will be the last written assignment for the semester, to allow you to focus on your paper from Thanksgiving onward. Also, while the assignment has a final deadline of 1128, you may turn it in on 1121 if you don't want to deal with any school work (for this class, at least) over the Thanksgiving holiday.

Not for Submission

Read Scott Chapter 8; if you have extra time, read (or start to read) Chapters 9 and 12 as well.

For Submission, 1121 or 1128

Commit the programming tasks under the specified directories with the tag *hw-1128*, and submit your answers to the assigned textbook exercises and other questions on hardcopy.

1. Do Scott Exercise 8.2 in our “big six” languages. Commit this under *arg-eval-order*, with one subdirectory per language (*c*, *cpp*, *java*, *js*, *ml*, and *perl*, respectively), tagged as *hw-1128*. On hardcopy, state the parameter evaluation order that you found for each language.
2. Answer Scott Exercise 8.7.
3. Answer Scott Exercise 8.11.
4. Answer Scott Exercise 8.15.
5. Answer Scott Exercise 8.25 (don't hesitate to write a test program to see what happens).
6. Explore the subroutine closure capabilities of our “big six” languages by implementing (or trying to implement) a *compose* function. The *compose* function should take two arguments: (1) *f*, a reference to another function/method/procedure/subroutine, and (2) *x*, some argument for *f*. *compose(f, x)* should evaluate *f(f(x))*. Provide the *compose* function itself, as well as some demonstration code that uses *compose*.

For example, if you have a function *square(x)* which calculates x^2 , then *compose(square, 3)* should return 81, or *square(square(3))*.

Note that your mileage *will* vary for each language, since they vary in terms of their support for subroutine closures. In other words, you will not be able to write *compose(f, x)* in exactly the same way in all six languages.

Commit this under *compose*, with one subdirectory per language, tagged as *hw-1128*.

7. Write a summary of your experience with implementing *compose*: (a) discuss what can and can't be done, (b) describe any limitations or constraints that you encountered, and (c) mention anything else that may be of interest which distinguishes the languages from each other.

For Optional Submission, 1128

Commit the latest draft of your paper to CVS (by 1128) if you would like me to look at it and give you feedback. While you can really do this at any time (and some of you have), mentioning this as part of the assignment provides some structure and an explicit deadline which might help some of you in managing your time.

Extra Credit

Answer Scott Exploration 8.47.