CS 360 Lab 2

Name:

Lab 2 tasks (all in Scheme)

Access Lab 2 code you tested in the preparation for Lab 2.

Part 1 (3 points)

(i) Load the file *delayedmap.scm*.
What will the Scheme interpreter print when asked to evaluate the following expressions in the given order?

(take 5 L)
(take 7 L)

Explain why in the second call to the *take* function, the numbers 1-5 are not printed out.

(ii) Load the file *BST.scm*.
It contains functions *member* and *insert*. Use function *insert* to construct a BST of height 2 consisting of numbers 1-7. Verify that all numbers 1-7 are in the BST using function *member*. How can you verify that the height of the tree you constructed is 2?

Show the results to the TA: _____ (initials)
You may open another session (keeping your current session active and available for reviewing) and proceed with the further work on Lab 2 if the TA is currently not available.

Part 2 (3 points)
Load *ch4-mceval.scm*. Execute the following code in the metacircular evaluator.

```
(define the-global-environment (setup-environment))
(driver-loop)

(define (append x y)
  (if (null? x)
      y
      (cons (car x)
            (append (cdr x) y))))

(append '(a b c) '(d e f))

(define (factorial n)
  (if (= n 1)
      1
      (* (factorial (- n 1)) n)))

(factorial 10)
```

Eva Lu Ator and Louis Reasoner are each experimenting with the metacircular evaluator. Eva types in the definition of map, and runs some test programs that use it. They work fine. Louis, in contrast, has installed the system version of map as a primitive for the metacircular evaluator. When he tries it, things go terribly wrong. Explain why Louis's map fails even though Eva's works.

Show the results to the TA: _____ (initials)
You may open another session (keeping your current session active and available for reviewing) and proceed with the further work on Lab 2 if the TA is currently not available.

Part 3 (4 points)
Load *dfa.scm*. Simulate the DFAs of Figures 4,5,7 of week 1 file. Demonstrate on example inputs that the DFA simulation works properly.

Show the results to the TA: _____ (initials)
You may open another session (keeping your current session active and available for reviewing) and proceed with the further work on Lab 2 if the TA is currently not available.

Part 4 (extra credit, 3 points)
Implement the solution of SICP Exercise 1.19, suggested in the SICP textbook, and demonstrate on several examples that it achieves its target of computation. You may directly adapt the code available at http://community.schemewiki.org/.

Show the results to the TA: _____ (initials)