CS 301

Lab 1

The primary programming activity in Scheme is the creation of recursive definitions, where problems are solved in terms of itself. After working through the increasingly difficult problems in chapter 1 of The Little Schemer, answer the following questions. Be sure to attempt the example schemes readily available throughout the text, frame notes preceded by “S:” concern Scheme.

Scheme expressions, or S-Expressions for Symbolic Expressions, are composed of lists or atoms. These expressions are used to construct recursive processes and manipulate recursive data-structures. Processes in Scheme use lists to represent function calls or collections of data. Primitive data types, or atoms include the following: boolean constants (t and f), numbers (integers, reals, and rationals), strings (e.g. “hello world!”), characters (e.g. #\c), and symbols (e.g. x, b11, sam).

1. Is (null? (cdr ‘(atom))) true or false?

2. Is (eq? (car (cons ‘(red) ‘(blue red))) (car (cdr ‘(blue red)))) true or false?

3. What does (car (cons l a)) evaluate to? Where l is (apple) and a is (peach orange apple).

4. What types of data may be compared using the eq? primitive?

5. Provide a list of the atoms 2, 4, 6 using three different schemes.