Informatics 41 • Fall 2008 • David G. Kay & Rich Pattis • UC Irvine • Your name _____

FOURTH QUIZ

You have 15 minutes from the start of class to complete this quiz. Read the problems with care; work with deliberate speed. Don't give us more than we ask for. The usual instructions apply. Good luck!

Problem 1 (4 points)

Fill in the blanks in the function described below. Note that `even?` is a predefined function in Scheme; it returns true if its argument is an even number.

```
;; count-evens:  list-of-numbers -> number
;; Return the number of even numbers in the input list
(define count-evens
 (lambda (L)
  (cond
    ((________________ L) ________________)

    ((even? (________________ L)) (________________ 1 (________________ (________________ L))))

    (else (________________ (________________ L))))))
```

Problem 2 (5 points)

Complete the definition of the function below according to the contract, purpose, and examples shown.

```
;; double-all:  list-of-numbers -> list-of-numbers
;; Return the input list with all its items doubled
(define double-all
  (lambda (L)
```

```
(check-expect (double-all empty) empty)
(check-expect (double-all (list 1 2 3 4 5)) (list 2 4 6 8 10))
```

Problem 3 (9 points)

We define a book as a structure `(define-struct book (author title year wholesale retail))` where `author` and `title` are strings and `year`, `wholesale`, and `retail` are numbers (representing the year the book was published, the book's wholesale price, and its retail price).

(a) (3 points) Define the function `book-prices-valid?` as described below.

```
;; book-prices-valid?:  book -> boolean
;; Return true if the book's retail price is greater than its wholesale price
(define book-prices-valid?
  (lambda (B)
```

(b) (6 points) Define the function `keep-valid-books` as described below. Where applicable, use functions you have already defined rather than duplicating code.

```
;; keep-valid-books:  list-of-book -> list-of-book
;; Return a list containing all the books on the input list whose prices are valid
(define keep-valid-books
  (lambda (L)
```

Problem 4 (2 points)

In class we discussed the relative advantages and disadvantages of command-line user interfaces and graphical user interfaces (GUIs).

(a) Give one advantage of a command-line user interface over a GUI.

(b) Give one advantage of a GUI over a command-line interface (other than "it looks nicer").