csc324 Quiz #3 Tuesday 08 February 2000

Duration: 15 minutes

Aids allowed: None

Family Name: _____ **Lecturer:** Diane Horton

First Name: _____

Student #: _____

Tutorial (circle one):

A-F	G-Lee	Lef-Se	Sf-Z
Ana	Diana	Peeter	Sean

Grade: _____

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1. What is the value of each of these expressions? Write "error" if it would produce an error.

```
(funcall '> '(55 33))      Answer: error: `(55 33)' is taken to be the
                                   one argument to >.
(funcall '> 55 33)         Answer: T
(apply '> '(55 33))        Answer: T
(apply '> 55 33)           Answer: error:  apply expects to receive
                                   a *list* of the arguments for >.
(eval '> '(55 33))         Answer: error:  EVAL got 2 args, wanted 1 arg.
(eval '> 55 33)            Answer: error:  EVAL got 3 args, wanted 1 arg.
```

2. Consider the following function:

```
(defun sum (list)
    (cond ( (eq (length list) 1)
                (car list)
          )
          ( t     (+ (car list) (sum (cdr list)))
          )
    )
)
```

What is the value of `(sum `(1 2 5 -1 3))`? Answer: `10`

What is the big-oh time complexity of a call to `sum` with a list of length n, in the worst case?

Answer: $O(n^2)$.

3. Consider the following function:

```
(defun blah (h r c)
    (cond ( (null h) nil )
          ( (eq (car h) c)
                (car r)
          )
          ( t     (blah (cdr h) (cdr r) c) )
    )
)
```

What is the value of `(blah '(a b c) '(1 2 3) 'c)`? Answer: `3`

What is the big-oh time complexity of a call to `(blah x y z)` in the worst case?
Define any variables that you introduce in your answer.

Answer: $O(n)$, where n is the length of list `x`.