Quiz 4b

1. (3 points) What will Scheme print in response to the following expressions? If an expression produces an error message, you may just write “error”; you don't have to provide the exact text of the message. If the value of an expression is a procedure, just write “procedure”; you don't have to show the form in which Scheme prints procedures. Also, draw a box and pointer diagram for the value produced by each expression.

> (list (cons (list 1 2 3) 4) (cons 5 (list 6 7)))

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> (cons (append (list 1 2) (list (list 3 4))) (cons 1 2))

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> (cons ‘() ‘())

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1. (3 points) At the end of the semester, the TA’s want to calculate the average grade for CS61AS. Write the procedure **avg-grade** that takes a list of grades as an argument and outputs the average of those grades. **Respect the data abstraction! You’ll get point deduction if there’s a data abstraction violation.** You may define one or more helper procedures.

    > (ave-grade ‘(3 3.3 4))

 > 3.4333333333

1. We are creating a dictionary, which is a list of entries. Each entry has a keyword and definition.

We set a global variable dictionary, defined as following:

(define dictionary (list (make-entry ‘(computer science) ‘(study of computers))

(make-entry ‘(emperor penguin) ‘(cutest animal in the world))))

a) (1 point) Define the selectors **keyword** and **definition** for the entry. Here’s the definition of the

constructor make-entry:

(define make-entry list)

b) (3 points) Define the procedure **get-definition** which takes a keyword as an argument and returns its definition. If there’s no such entry with the given keyword in the dictionary, then the procedure returns **#f**. **You’ll get point deduction if there’s a data abstraction violation.** You may define one or more helper procedures.

> (get-definition ‘(emperor penguin))

> (cutest animal in the world)

> (get-definition ‘human)

> #f

(define (get-definition keywd)