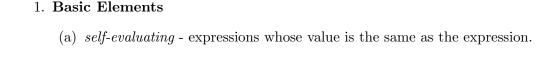
MASSACHVSETTS INSTITUTE OF TECHNOLOGY

Department of Electrical Engineering and Computer Science 6.001—Structure and Interpretation of Computer Programs Fall 2007

Recitation 2

More	Scheme
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(b) names - Name is looked up in the symbol table to find the value associated with it. Names may be made of any collection of characters that doesn't start with a number.

2. Combination

(procedure arguments-separated-by-spaces)

Value is determined by evaluating the expression for the procedure and applying the resulting value to the value of the arguments.

3. Special Forms

(a) define - (define name value)

The name is bound to the result of evaluating the value. Return value is unspecified.

(b) if - (if test consequent alternative)

If the value of the test is not false (#f), evaluate the consequent, otherwise evaluate the alternative.

(c) lambda - (lambda (arg1...argn) expression1...expressionn)

We will see this in more detail in lecture. A lambda captures a common pattern of computation as a procedured. When applied to a set of arguments, it "substitutes" the value of each expression for the corresponding argument in the body of the lambda, then evaluates the body.

Problems

1. Evaluate the following expressions

```
4
(+ 1 2)
(7)
(* (+ 7 8) ( - 5 6))
(define one 1)
(define two (+ 1 one))
(define five 3)
(+ five two)
(define biggie-size *)
(define hamburger 1)
```

```
(biggie-size hamburger five)
(= 7 (+ 3 4))
(= #t #f)
((+ 5 6))
biggie-size
```

2. Evaluate the following expressions (assuming x is bound to 3):

```
(if #t (+ 1 1) 17)

(if #f #f 42)

(if (> x 0) x (- x))

(if 0 1 2)

(if x 7 (7))
```

3. Evaluate the following expressions:

```
(lambda (x) x)

((lambda (x) x) 17)

((lambda (x y) x) 42 17)

((lambda (x y) y) (/ 1 0) 3)

((lambda (x y) (x y 3)) (lambda (a b) (+ a b)) 14)
```

- 4. Suppose we're designing an point-of-sale and order-tracking system for Wendy's¹. Luckily the Über-Qwuick drive through supports only 4 options: Classic Single Combo (hamburger with one patty), Classic Double With Cheese Combo (2 patties), and Classic Triple with Cheese Combo (3 patties), Avant-Garde Quadruple with Guacamole Combo (4 patties). We shall encode these combos as 1, 2, 3, and 4 respectively. Each meal can be biggie-sized to acquire a larger box of fries and drink. A biggie-sized combo is represented by 5, 6, 7, and 8 respectively.
 - (a) Write a procedure named biggie-size which when given a regular combo returns a biggie-sized version.

¹6.001 and MIT do not endorse and are not affiliated with Wendy's in any way. They merely capitalize on the pleasant way "biggie-size" rolls off the tongue.