

Sabancı University
Faculty of Engineering and Natural Sciences

CS305 Programming Languages

Homework 4

Due: May 5, 2020 (Tuesday) @ 23:55

1 Introduction

In this homework you will evaluate values of some Scheme expressions using MIT Scheme interpreter. It would help you to understand how things work. It would be better for you, if you first try to guess the value of the expressions, and then have it evaluated by the MIT Scheme interpreter.

2 Expressions

There are 59 expressions given below. Evaluate all of these expressions, first on paper, and then by using MIT Scheme interpreter.

```
1
(+ 1 2)
(+ 1 2 3 4 5 6)
(- 5 (+ 1 2))
(+)
(define x 2)
x
(define y (* 10 4))
y
(/ y (- 8 1 x))
(define add +)
(add 2 3)
(define + -)
(- (+ 2 3) 1)
(define + add)
(- (+ 2 3) 1)
(if #t "true" "false")
(if #f "true" "false")
(if "true" "false" "true")
(if "false" "false" "true")
(if 0 'true 'false)
```

```

(if 1 'true 'false)
(if -1.5 'true 'false)
(if (< x y) (/ y x) (/ 100 0))
(if (>= x y) (/ y x) (/ x y))
(if (= x 2.0) x y)
(boolean? #t)
(boolean? #f)
(boolean? "true")
(boolean? "false")
(boolean? 'true)
(boolean? 'false)
(symbol? "symbol")
(symbol? 'not-a-symbol)
(eq? 'x 'y)
(eq? 'x x)
(define x 'this-symbol)
(define y (quote this-symbol))
(eq? x y)
(eq? x 'this-symbol)
(list 1 2 3 4 5)
(list 1 'a '2 x)
'(1 a 2 x)
(list '(+ 1 2) (+ 1 2))
(list (list (list 1 2) 3 4) (+ 2 3) (- 8 2))
(list)
(list (list '()))
(cons 1 2)
(cons 1 '(2))
(cons 'a (list 'b 'c 'd))
(cons 'a '(b c d))
(list 'a '(b c d))
(car (list 1 2 3))
(cdr (list 1 2 3))
(car (cons 1 '(2)))
(cdr (cons 1 '(2)))
(car (cons 1 2))
(cdr (cons 1 2))
(map apply (list cons list (lambda x (car x))) (list '(1 2) '(1 2) '(1 2)))

```

3 How to Submit

There are 59 expressions above. Let us call the first expression exp_1 , the second expression exp_2 , ..., and the last expression exp_{59} . Let val_i ($1 \leq i \leq 59$) be the value printed out by the MIT Scheme interpreter for the expression exp_i .

Submit a text file named **id-hw4.txt**, where id is your username. This file shall have 59 lines, where on line 1 we have val_1 , on line 2 we have val_2 , ..., and on the last line we have val_{59} . So, your text file will go like

1
3
...
...
...

4 Notes

- **Important:** Name your files as you are told and **don't zip them**. [-10 points otherwise]
- **Important:** Make sure that your file has exactly 59 lines, and the order of your expressions are not shuffled or shifted.
- No homework will be accepted if it is not submitted using SUCourse.
- We will have STF (Submission Time Factor) for late submissions (0.01 drop in STF for each 5 mins of delay after the deadline).