

Assignment

HW09: Sebesta: Problem Set 15.(9, 10), Programming Exercises 15.(10, 11, 19, 20)

HANDWRITTEN – Due at beginning of class on due date.

PROGRAM – Due at midnight, via Blackboard, at midnight on day prior to due date.

Handwritten Portion

9. What does the following Scheme function do?

```
(define (y s lis)
  (cond
    ((null? lis) '() )
    ((equal? s (car lis)) lis)
    (else (y s (cdr lis)))
  ))
```

10. What does the following Scheme function do?

```
(define (x lis)
  (cond
    ((null? lis) 0)
    ((not (list? (car lis)))
     (cond
       ((eq? (car lis) #f) (x (cdr lis)))
       (else (+ 1 (x (cdr lis))))))
    (else (+ (x (car lis)) (x (cdr lis)))))
```

Programming Portion**NOTE: For ALL of these programs, you are to use Racket**

10. Write a Scheme function that takes two atoms and a list as parameters and returns a list identical to the parameter list except all occurrences of the first given atom in the list are replaced with the second given atom, no matter how deeply the first atom is nested.
11. Write a Scheme function that returns the reverse of its simple list parameter.
19. Write the quicksort algorithm in Scheme.
20. Rewrite the following Scheme function as a tail-recursive function:

```
(DEFINE (doit n)
  (IF (= n 0)
      0
      (+ n (doit (- n 1)))
  ))
```

Grading Rubric

The assignment is worth 25 pts (as a whole) and the score will be recorded as a percentage of that amount.

	Handwritten						Programming			
Problem	15.9	15.10					15.10	15.11	15.19	15.20
Points	3	3					5	4	6	4

10% Physical Format

50% Answers correct (and supported by work)

40% Effort evidenced by the submitted work