Programming Principles

Homework No. 3 [30 points]

Due: November 14, 2018 2:20PM

Write your report in English. Submit your written paper report and racket file for the problems that are specified in the problem description. When "run" button is pushed, your interaction window must show your testing results. If you need to write your solution on the paper as specified, write on the paper. Submit your Racket file (in a single file) to TA (email: 204606131@qq.com), so that TA can test your program. Your file name must be "PP_hw3_*your_student_id_number.rkt*". Submit your answer sheet (if any) at the class. Don't forget documenting your programs. Make the first comment of your program be your student id and name, so that TA can find who you are.

1. [4 points] Exercise 2.27 of the text book.

2. [12 points] Exercise 2.29 of the text book.

3. [3 points] Exercise 2.34 of the text book.

4. [3 points] Exercise 2.36 of the text book.

5. [4 points] Exercise 2.38 of the text book.
   Write your answer on the paper and submit it at the class.

6. [4 points] Write a function **`subsequence`** that, given a function ***`fun`*** and a list **`alist`** of *n* elements computes a new list of *n* elements. The first element is **`(`*`fun`*** **`alist)`** of the whole list. The second element is ***`fun`*** applied to a list consisting of all but the first element of **`alist`**, etc. For example, if ***`sum`***, defined below, adds up all the elements of a list,

```
(define (sum alist)
  (if (null? alist) 0 (+ (car alist) (sum (cdr alist)))))
```

then **`(subsequence sum '(7 9 3 5))`** returns **`(24 17 8 5)`**.