COP 4020: Programming Languages

Spring 2019

Project 2

Instructions

- **Submission Deadline**: **Friday, April 5, 2019, 11:59pm**. Submit your assignment through Canvas. Write a separate file for each problem. Zip all the files together and submit through Canvas. Test your code with sample inputs (created by you) to make sure it runs correctly, to receive full credit
- This is an individual project and not a group project. You are supposed to work on your own for this project
- Total points possible: 20

Question 1. Write a Scheme program for each of the following. You can use the "linprog" server for your implementation – it has Scheme installed in it.

a) To reverse a list. You are not allowed to use the built-in function "reverse". Input to the program is a list. Print the final list. For instance,

lst = (5 11 22 3)

output: (3 22 11 5) (**5 points**)

b) To insert an element "a" in a sorted list "lst" (sorted in ascending order), such that the resulting list is still sorted. Input to the program are "a" and "lst". Print the final list. For instance,

lst = (1 4 7 12 19) and a = 6,

output: (1 4 6 7 12 19) (**5 points**)

c) To check if an item "a" is present in a list "lst". The program should return "#t" if the item is present and "#f" otherwise. Input to the program are "a" and "lst". For instance,

lst = (6 22 3 7 8) and a = 3

output: #t

lst = (6 22 3 7 8) and a = 9

output: #f (**5 points**)

d) Which takes in two lists "lst1" and "lst2", both of which are individually sorted (in ascending order), and returns a list containing the elements of both lst1 and lst2 in sorted order. Print the final list. Input to the program are "lst1" and "lst2". For instance,

lst1 = (1 3 5 7) and lst2 = (2 4 6 8)

output: (1 2 3 4 5 6 7 8) (**5 points**)