

Name: _____

5 questions in 120 minutes

Question 1 (20%)

Give the sequences of car's and cdr's needed to get x in the following expressions; for convenience name the list under discussion as `lst` – the first one is answered to clarify the question:

- (a) `(a x b d)`
`(car (cdr lst))`
- (b) `(a (b (x)) d)`
- (c) `(a (b (x d)))`
- (d) `(a (b (d) x c))`
- (e) `((((a (b (x c) d))))`

Question 2 (40%)

A given set A is a **subset** of another set B if and only if all the members of A are also a member of B . Two sets are **equivalent**, if and only if they are subsets of each other. For this problem you will represent sets via lists.

- (a) Define a procedure `SUBSETP` that takes two list arguments and decides whether the first is a subset of the second.
- (b) Define a procedure `EQUIP` that takes two list arguments and decides whether the two are equivalent.
- (c) Define a procedure `IDENP` that takes two list arguments and decides whether the two have the same elements in the same order – do not directly compare the lists with `EQUALP`, you are required to do a element by element comparison.

Question 3 (40%)

Assume you have data that pairs employees' last names with their monthly salaries. Define a procedure that takes as input employee data and (ii) a threshold salary (an integer), and returns in a list the last names of all the employees that earn above the threshold salary. Define two versions, one with, and one without an accumulator.