1. (10 points) Design a procedure \( \text{CountElt \ elt \ l1} \) that takes as arguments an atomic element \( \text{elt} \) and a sequence \( \text{l1} \) (a simple list with no embedded sublists) and returns a count of the number of times that \( \text{elt} \) appears in \( \text{l1} \). For example

\[
\text{(CountElt \ 3 \ '(5 3 6 5 3 6 3 4 9 3)) returns 4}
\]
\[
\text{(CountElt \ 'a \ '(5 4 a 3 2 a b)) returns 2}
\]

Make sure that you recognize the time complexity of your procedure \( \text{CountElt} \).

2. (10 points) Design a procedure \( \text{PairsDiff \ l1 \ l2} \) that takes as arguments two sequences \( \text{l1} \) and \( \text{l2} \) (simple lists with no embedded sublists) of integers and returns a list of sublists containing the corresponding elements of \( \text{l1} \) and \( \text{l2} \) that are not equal. You may assume that the argument lists are the same length. For example,

\[
\text{(PairsDiff \ '(5 8 2 4 1 3) \ '(4 8 9 6 1 2)) returns ( (5 4) (2 9) (4 6) (3 2) )}
\]

Make sure you recognize the time complexity of your procedure \( \text{PairsDiff} \).

3. (10 points) Design a procedure \( \text{Filter \ l1 \ p} \) that takes as arguments a sequence \( \text{l1} \) (simple list with no embedded lists) of integers and a predicate \( \text{p} \) and returns the list with only those integers satisfying the predicate \( \text{p} \) remaining. For example,

\[
\text{(Filter \ '(13 54 90 15 6 36 88) \ (lambda(x)(< x 20)) ) returns (13 15 6)}
\]

4. (15 points) Design a procedure \( \text{CountSubtrees \ l1} \) that takes as argument a tree \( \text{l1} \) (a complex list whose elements are not necessarily atomic) and returns a count of the number of subtrees (ie., the embedded lists at any depth). For example,

\[
\text{(CountSubtrees \ '(4 2 (5) (a (4 3) 2 (4 b)) 7) (6 2))) returns 6}
\]

5. (15 points) Design a procedure \( \text{RemoveEven \ l1} \) that takes as argument a tree of integers \( \text{l1} \) (a complex list whose elements are not necessarily atomic), and returns the list with all instances of numbers that are even removed from the list. For example,

\[
\text{(RemoveEven \ '(19 33 6 (65 88 (33 69 76 61 10)) (75 42) (44 67 (8) 33))) returns (19 33 (65 (33 69 61)) (75) (67 ())))}
\]

Submit your code for the above procedures on the electronic submission system for Homework-5.