Problem 1

CS 330 Fall 2017, Prolog assignment

Due: November 7, 2017 Professor: Carlotta Domeniconi

Suppose we represent sets of integers as lists of integers with no duplicated elements. Write Prolog rules for the following set operations (do NOT use any pre-defined predicates):

* subset(A,B): returns true if set A is a subset of set B; false otherwise.
* union(A,B,C): returns the union of sets A and B. C is used to store the result.
* intersection(A,B,C): returns the intersection of sets A and B. C is used to store the result.
* difference(A,B,C): returns the set difference of sets A and B. C is used to store the result.  Here are few examples of queries and expected responses of the Prolog interpreter: ?- subset([1, 3, 5], [5, 1, 2, 3]).  yes  ?- subset([1, 3, 5], [3, 1, 5]). yes  ?- union([1, 2, 3], [2, 3, 7, 9], U ). yes, U = [1,2,3,7,9]  ?- intersection([1, 2, 3], [2, 3, 7, 9], I ). yes, I = [2, 3]  ?- difference([1, 2, 3], [2, 7, 9, 3], D). yes, D = [1]

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Problem 2

Write a Prolog rule for the predicate elimdup(L1,L2), which eliminates duplicate elements from a list. L1 is a given list of elements, and L2 is used to store the result.

Here are few examples of queries and expected responses of the Prolog interpreter: ?- elimdup([1, 3, 5, 3],R).

yes, R = [1,3,5] ?- elimdup([1, 3, 5], R).

yes, R = [1,3,5] ?- elimdup([a, b, a, c, b], R).

yes, R = [a,b,c] ?- elimdup([a, b, a, c, b, a], R).

yes, R = [a,b,c]