

CMSE 462 Assignment 5

(Prolog - II)

Program to be done in groups of two. Pick your partner!

Implement the following predicates in Prolog.

countHowMany(E,L,N). N is the number of times E occurs in list L. For example, `?-countHowMany(b,[a,s,b,d,b,e,b],R)` should bind R to 3.

reversePairs(X,Y). Y is a list obtained by reversing the first two elements, followed by reversing the next two elements, etc., in X. For example, `?-reversePairs([1,2,3,4,5,6,7,9],R)` should bind R to `[2,1,4,3,6,5,9,7]`.

split(X,N,Y,Z). Y is a list obtained by taking the first N elements of list X and putting them in Y, and the remaining elements in Z. For example, `split([a,s,d,f,g,h,j],2,R1,R2)` should bind R1 to `[a,s]`, and R2 to `[d,f,g,h,j]`.

minMax(L,Min,Max). Min is the smallest element of L, and Max is the largest. For example, `?-minMax([5,3,4,6,3,8],R,S)` should bind R to 3, S to 8.

vector_add(A,B,C). If A and B are lists of numbers, then C is a list of numbers such that an element of C at position i is the sum of the element of A at position i and the element of B at position i. For example, `?-vector_add([1,3],[5,8],R)` should bind R to `[6,11]`.

doubled(List). Let's call a list doubled if it is made of two consecutive blocks of elements that are exactly the same. For example, `[a,b,c,a,b,c]` is doubled (it's made up of `[a,b,c]` followed by `[a,b,c]`) and so is `[foo,gubble,foo,gubble]`. On the other hand, `[foo,gubble,foo]` is not doubled. Write a predicate `doubled(List)` which succeeds when List is a doubled list.

swapFirstLast(List1,List2). Checks whether List1 is identical to List2, except that the first and last elements are exchanged. For example, `?-swapFirstLast([1,2,3,4,5],[5,2,3,4,1])` should succeed. `?- swapFirstLast([a,2,3,4,b],X)` should succeed and bind X to `[b,2,3,4,a]` etc.

What to hand in: CD containing your program, as well as screenshots (.jpg) for the results obtained by a call to each predicate. Make sure your name, student number, as well as the course name, semester, and assignment number appear on the CD.

More than one group may use the same CD, provided that their work is in separate directories, and the directories are named by student numbers.