

1999 Paper 1 Question 1

Foundations of Computer Science

A *permutation* of a list is any list that can be derived from it by re-arranging the elements. Write an ML function that returns the list of all the permutations of its argument. Explain your code clearly and carefully.

For example, applied to the list $[1,2,3]$, your function should return the list whose elements are $[1,2,3]$, $[2,1,3]$, $[2,3,1]$, $[1,3,2]$, $[3,1,2]$ and $[3,2,1]$.

You may assume that the elements of the argument are distinct. The elements of the result may appear in any order.

[10 marks]