

2001 Paper 1 Question 10

Programming in Java

For each of the following ML definitions write, explain and comment on the closest reasonable Java equivalent code-fragment that you can construct.

(a) `fun fact n r = if n = 0 then r
 else fact (n-1) (n*r);` [4 marks]

(b) `datatype 'a tree = leaf of 'a |
 node of 'a tree * 'a tree * 'a tree;` [4 marks]

(c) `val v = [1,2,3,7];
 val v2 = map (fn n=>n*n:int) v;` [4 marks]

(d) `exception Disaster of int;
 raise Disaster 99;` [4 marks]

(e) `fun recursiveLength nil = 0
 | recursiveLength (a :: b) = 1 + recursiveLength b;` [4 marks]