

1998 Paper 1 Question 10

Programming in Java

Write fragments of Java definitions, declarations or code to achieve each of the following effects. You are not expected to show the whole text of a complete program — just the parts directly important for the task described — and you may describe in words rather than Java syntax any supporting definitions or context that you will want to rely on. Clarity of explanation will be viewed as at least as important as syntactic accuracy in the marking scheme. It is also understood that names of methods from the standard Java class libraries are things that programmers check in on-line documentation while writing code, so if you need to use any of these you do not need to get their names or exact argument-format correct provided that (a) you describe clearly what you are doing and (b) your use is correct at an overview level.

- (a) Take a `long` argument called `x` and compute the `long` value obtained by writing the 64 bits of `x` in the opposite order. [6 marks]
- (b) Define a class that would be capable of representing simple linked lists, where each list-node contains a string. You should show how to traverse such lists, build them and how to reverse a list. In the case of the list reversing code please provide two versions, one of which creates the reversed list by changing pointers in the input list, and another which leaves the original list undamaged and allocates fresh space for the reversed version. [8 marks]
- (c) Cause a line to appear in the window of an applet running from the bottom left of the window towards the top right. Your line should remain visible if the user obscures and then re-displays the window, but you can assume that the size of the windows concerned will be fixed at 100 by 100 units. [6 marks]