

2001 Paper 4 Question 5

Data Structures and Algorithms

- (a) Outline how you would determine whether the next line segment turns left or right during the Graham scan phase of the standard method of computing the convex hull of a set of points in a plane. [5 marks]
- (b) Describe in detail an efficient algorithm to determine how often the substring ABRACADABRA occurs in a vector of 10^6 characters. Your algorithm should be as efficient as possible. [10 marks]
- (c) Roughly estimate how many character comparisons would be made when your algorithm for part (b) is applied to a vector containing 10^6 characters uniformly distributed from the 26 letters A to Z. [5 marks]