

1997 Paper 3 Question 6

Data Structures and Algorithms

Describe and justify Kruskal's algorithm for finding the minimum spanning tree of an undirected graph. [6 marks]

Suppose that all edges longer than some given L were omitted from the graph, for example as a result of not calculating them at all. Would the algorithm still give the correct result? Would you be able to tell if it had not? If it yielded a tree would it be guaranteed to be the best one? Justify your answers and consider the problem of finding a minimum spanning tree for 1,000,000 points in a plane rectangle where there is an edge between every pair of points and the cost of the edge is the Euclidean distance between the two points. [14 marks]