



IEEEXtreme 10.0 > Finding Shelter

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Intended complexity O(N^2 * sqrt (N) * log N)

Solution:

You can binary search for the maximal distance between a soldier and a shelter. You can create a bipartite graph with $2 \times N$ nodes, on the left side the N soldiers and on the right side the N shelters. There will be an edge between soldier i and shelter j only if distance(i, j) <= value (the value that is binary searched). To check if you can assign the soldiers to shelters you can use a maximum matching algorithm on the bipartite graph. If there is a perfect matching then you search for a lower value, otherwise you search for a bigger one. After you find the lowest maximal distance between a soldier and a shelter (for which you still have a perfect matching), you need to find a matching with lowest sum of distances. This is an instance of the Assignment problem, which you can solve with a max flow min cost algorithm.

Statistics

Difficulty: Hard Publish Date: Aug 04 2016

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