Finding Shelter

locked

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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 × *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

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