Range Searching: reporting of all minimal points

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Abstract

We study a case of range searching - reporting of all minimal points for a query. For n points in the plane, we give a simple data structure which requires $O(n \log n)$ storage, $O(n \log n)$ preprocessing time, and through which $O(h + \log n)$ reporting time is possible, where h is the size of output. In three dimension, we give a data structure which requires $O(n(\log n)^2)$ storage and achieves $O(h(\log n)^2)$ reporting time. This method could be generalized to higher dimension. In $d \geq 3$ dimension, the size of the data structure is $O(n(\log n)^{d-1})$, and the reporting time is $O(h^{d-2}(\log n)^{d-1})$.