The Set-Maxima Problem

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Abstract

In this talk I will introduce the classical Set-Maxima problem on Hypergraphs and a special case called Local Sorting on Graphs. It is one of the few remaining problems along with the Minimum Spanning Forest whose exact deterministic comparison complexity remains undetermined. Given a (unknown) totally ordered set X and a collection of subsets of X denoted by S the Set-Maxima problem is to determine the maximum element of each of the subsets in the collection S. It was conjectured that if $|X| = n$ and $|S| = m$ then this can be solved with $O(n \log((n+m)/n))$ comparisons. The lower bound under the comparison tree model was proven to be this by Yao and Graham. However, no non-trivial upper bound is known. Few special cases have been solve. In this talk we discuss this problem in a geometric setting and give a solution for Set-Maxima under it.

Keywords: graph, hypergraph, local sorting, deterministic comparison complexity.