

Seminar on Sublinear Time Algorithms – Handout 5

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1 Today's topics

- Query complexity lower bound for element distinctness
- Query complexity lower bound for testing juntas

2 Homework

1. The lower bound shown in class for testing k -junta depends on k but not on ε . Extend it so that it does increase with ε . You may restrict attention to non-adaptive algorithms.

Extra credit: if you prove it for adaptive algorithms.

2. Show a query lower for testing monotonicity, for algorithms that can only compare the queried elements. In other words, if the algorithm queries positions i and j , then it only knows whether $x_i < x_j$ or not (but does not know these values).

Hint: For the hard distribution, swap blocks of length 2^i for a random i .

Extra credit: if you prove it for algorithms that do see the values x_i .