Fundamental Algorithms 5

Exercise 1 (Optimizing SeqSearch)

1. Optimize the algorithm SEQSEARCH for sorted arrays, i.e. that it stops the search as soon as the elements become too large.

2. Make a reasonable assumption for the probability that x is found at position i or not found at all, and give an estimate of the average number of comparisons that are required.

3. How does the complexity differ from the regular SEQSEARCH algorithm? What causes this difference?

Exercise 2 (Binary Search)

Formulate a recurrence equation for the number of comparisons in the BINARYSEARCH algorithm of the lecture. Solve this equation to estimate the time complexity of BINARYSEARCH. You may assume that the input is of size 2^k for some $k \in \mathbb{N}$.