Universität Erlangen-Nürnberg
Department of Computer Science 7
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Introduction to Data Structures and Algorithms

Exercise sheet 2

Exercise 1:

Assume that there are three algorithms A, B and C for solving a certain problem. The number of arithmetic operations executed by algorithms A, B and C, dependent on the size of the problem input, is 2^n, n and $\log_2 n$, respectively. We assume that the execution time of an arithmetic operation is one microsecond.

   a) What ist he maximal problem size that can be dealt with by algorithms A, B and C in time 1ms, 1s, 1min, 1h?

   b) What is the factor by which the maximal problem size increase if the time is doubled for algorithms A, B and C ?

Exercise 2:

From the lecture you know the complexity of the *fibrec*-algorithm for computing the Fibonacci Numbers f_i. f_i is growing exponentially, given by the term

$2^{(i-2)/2} \le f_i \le 2^{i-2}$ for $i \ge 2$.

Prove the correctness of this expression !