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Fundamental Algorithms

Question 1

Show that

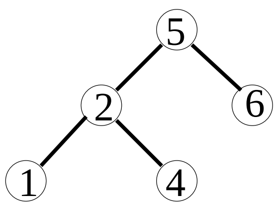
a) $(\log n)^4 = o(n)$
b) $n \log^2 n = O(n^2)$
c) $\frac{1}{2}n^2 + \frac{1}{2}n = \Theta(n^2)$

Question 2

You are given a hashtable with 50 entries, and your universe consists of the numbers $1, 2, \ldots 200$ which are all equaly likely to be hashed. Which hashfunction would you use? Which hashfunction would you use, if the numbers $1, 2, \ldots 25$ and $51, 52, \ldots 75$ were twice as likely to be hashed as the rest?

Question 3

Insert first 3 and then 7 into the following AVL-tree



Question 4

Show that one needs at least $n-1$ comparisons to find the minimum of n numbers.