

Design and Analysis of Algorithms

Quiz 1

Sep 10, 2004

1. [20] Suppose $f(n) = 2$ and $g(n) = 10^{100}$. Prove or disprove: $f(n) = \Theta(g(n))$.
2. [20] Write the following seven functions in increasing order of asymptotic complexity:
 $n^2 + \log n, 2^n, n!, n \log n, \log \log n, (\log n)^2, 6$.
3. [20] Prove or disprove: if $f(n) = O(g(n))$, then $2^{f(n)} = O(2^{g(n)})$.
4. Solve the following recurrence relations:
 - (a) [20] $T(n) = 3T(n/2) + n \log n$
 - (b) [20] $T(n) = 4T(n/2) + n^2 \sqrt{n}$.