
Due on Wednesday 19

Problem 1: Prove that the Big-O relation is transitive. That is, if $f(n) = O(g(n))$ and $g(n) = O(h(n))$ then $f(n) = O(h(n))$.

Problem 2: For each pair of functions determine their asymptotic relation, i.e., ω , Ω , Θ , O or o . You don't need to justify your answer. If several apply, list them all.

$\log n$	$\log n^{10}$
$\log n!$	n
2^n	n^n
e^n	$n^{\frac{n}{\ln n}}$
$n^{\frac{1}{\log n}}$	20
$n^{\log n}$	$(\log n)^n$

Problem 3: Chapter 2, Exercise 6.

Problem 4: In class we showed that the number of iterations of the Gale-Shapley algorithm for finding a stable matching is at most n^2 . Show that this is asymptotically tight by giving an instance where the number of iterations is $\Omega(n^2)$.