1st Assignment
CS430 Introduction to Algorithm, Fall 2019

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September 10, 2019

This homework is due at 11:59pm on September 22, 2019

Assignment Instruction

- Team work is allowed, max 4 students per team.
- ONLY team leader submits the PDF version of the assignment to the Blackboard. You also HAVE TO include all the team members' full name and A-number in the first page of the submission.
- Late submissions won't be accepted.
- All solutions should be explained.

Problem 1 (25pts)

Do Problem 2.3-3 on page 39 in CLRS. Justify your answers.

Problem 2 (25pts)

1. Rank the following functions by order of growth; that is, find an arrangement $f_1, f_2, \cdots, f_{24}$ of the functions satisfying $f_1 = O(f_2), f_2 = O(f_3), \cdots, f_{23} = O(f_{24})$. Briefly show your work for this problem.

$\lg(\lg^* n)$	$n^{\lg \lg n}$	$n^{\log_6 5}$	n^2	n!	2^{2n}
$(\frac{4}{3})^n$	$n^2 + n$	$(\frac{3}{4})^n$	$\lg(n!)$	2^{2^n}	$n^{1/\lg n}$
$\ln\ln n$	2^n	$n2^n$	n^n	$\ln n$	$n \lg n$
$2^{\lg n}$	$(\lg n)^{\lg n}$	n	$\sqrt{\lg n}$	1	$\lg^*(\lg n)$

2. Partition your list into equivalence classes such that $f(n)$ and $g(n)$ are in the same class if and only if $f(n) = \Theta(g(n))$.

Problem 3 (50pts)

Do Problem 4-3 (a) to (e) on page 108 in CLRS. Justify your answers.