

# CS140 - Group 1

Due: Friday, 9/6 at 10pm

Please work on these questions for no more than an hour. Once you have something you're comfortable submitting (note that we are evaluating based on effort+participation, not correctness!).

One person in your group should upload the responses as a single file to gradescope, making sure to add everyone who worked together in your group

You do not need to typeset your responses in L<sup>A</sup>T<sub>E</sub>X; if you want to take a photo of your work and upload that as a single file that's fine (as long as it's readable!)

## 1. Your group

- (a) Who is in your group and what superpower does each member bring to the group?
- (b) What is your the mentor's favorite food (the mentor that helped you out)?

## 2. Ranking Functions

List the functions below in increasing order by placing one function on each line, with the top line containing the smallest function and the bottom line containing the largest function. If two functions are in the same group (functions  $f(n)$  and  $g(n)$  are in the same group if  $f(n)$  is  $O(g(n))$  and  $g(n)$  is  $O(f(n))$ ) then write those two functions together on the same line. (You should assume, that the size of the problem,  $n$ , is an integer in all cases.) No proofs are necessary, just the correct ranking. To help you establish the ranking, you will need to compare pairs of functions and you can use any methods that you want. Useful methods include algebraic manipulation (e.g. rewriting a function in another form that allows you to compare it more easily with a second function) and numerical experiments (e.g. choose  $n$  to be some large power of 2 and then evaluate the two functions on that value).

$n!$	$e^n$	$n \log_4 n$	47
$n^{1/3} + \log_5 n$	$n$	$(\frac{3}{2})^n$	$n2^n$
$(\log_2 n)^{\log_2 n}$	$\sqrt{n}$	$2^n$	$n^{\log_2 \log_2 n}$
$\log_2(n!)$	$n^2$	$(n+1)!$	$4^{\log_2 n}$

## 3. Class experience How is everything going so far? Any suggestions for improvements?