

HW 07 Practice Problems

Due: DO NOT SUBMIT

Instructions:

- These practice problems are helpful to warm-up for the homework itself. They're great to discuss with course staff or class mates because **these problems are not to be handed in** so you may discuss ideas freely without worrying about academic integrity issues. Solutions will be provided immediately with the problems themselves.

Problem 1 Induction: Factorial Inequality

Using induction, show that $n! < n^n$ for all $n > 1$. (You may find it helpful to see the practice problem on induction to see what is required of your proof).

Problem 2 Recursion

Solve each of the following recurrences by substitution. Assume a base case of $T(1) = 1$. As part of your solution, you will need to establish a pattern for what the recurrence looks like after the k -th substitution. Check that this pattern is consistent with your substitutions, but you do not need to formally prove it is correct via induction.

i $T(n) = T(n - 2) * 7$