

CS 170 Spring 2008 - Homework #1

- Problems 0.1, 0.4, 1.4, 1.5, 1.20

Here is the level of justification we expect for 0.1. You should use rules that you learned in Math 55 or CS 70, namely:

- $f_1 = O(g_1)$ and $f_2 = O(g_2)$ implies $f_1 + f_2 = O(g_1 + g_2)$
- $f_1 = O(g_1)$ and $f_2 = O(g_2)$ implies $f_1 \times f_2 = O(g_1 \times g_2)$
- $n^a = O(n^b)$ if $a < b$
- $a^n = O(b^n)$ if $a < b$
- $\log(n) = O(n)$
- $n = O(b^n)$ for any $b > 1$
- if $\frac{f(n)}{g(n)}$ approaches a finite nonzero constant as $n \rightarrow \infty$, then $f = \Theta(g)$
- if $\frac{f(n)}{g(n)}$ approaches 0 as $n \rightarrow \infty$, then $f = O(g)$ but not $\Omega(g)$

If you can't apply any of these, you may go back to the definition of $O()$, but we prefer short answers based on these rules. For example, it is enough to write $10 + n + n^2 = O(n^2)$ without further explanation.