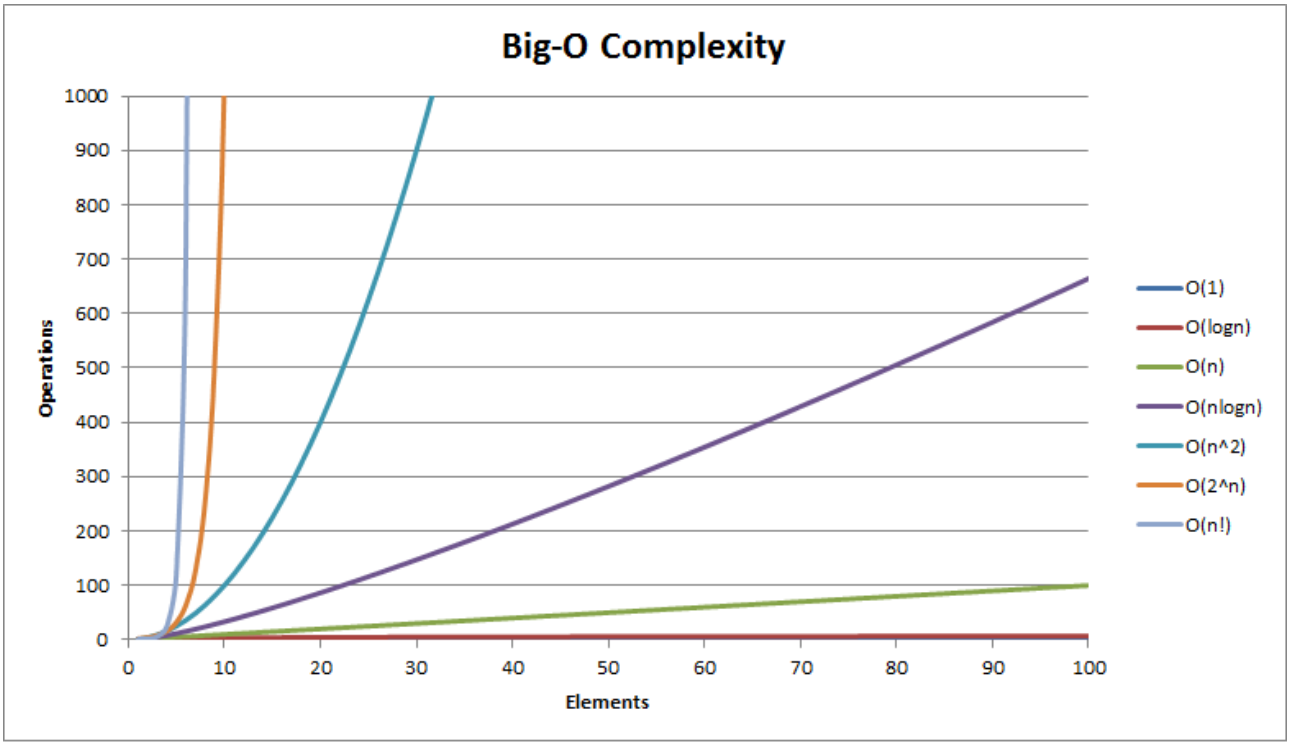
Lab 1

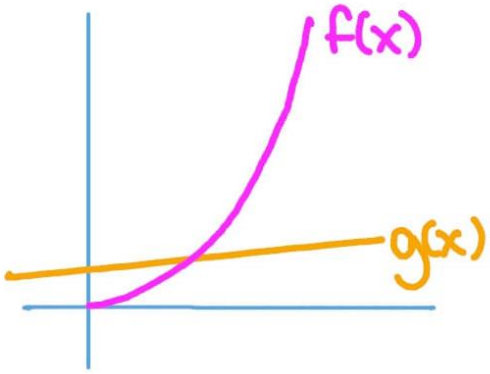
Growth Rate

1. Constant Time **O(n)**
2. Logarithmic Function **O(logn)**
3. Linear Function **O(n)**
4. Quadratic Function **O(n^2)**
5. Cubic Function **O(n^3)**
6. Exponential Function **O(2^n)**



Growth Rate Function Comparison

After some point f(n) is greater than g(n). After that point it's guaranteed that f(n) is bigger than g(n) but before that point we cannot guarantee that f(n) is bigger than g(n).



That means that f(n) is asymptomatically bigger than g(n).

Problems

1. Assume that $f(n) = 5n + 50$ and $g(n) = n$. Is $f(n) = O(g(n))$
2. Find the upper bound for $f(n) = 3n + 8$
3. Find the upper bound for $f(n) = n^2 + 10$
4. Find the lower bound for $f(n) = 10n^2 + 5$
5. Show that $f(n) = n^3 + 3n^2 = \Theta(n^3)$