# Algorithms Homework 1* 

Asymptotic notation and Summations

## Reading: GT Chapter 1

1. (GT R-1.6) Order the following list of functions in ascending order of growth by the big-Oh notation. Group together those functions that are big-Theta of one another. For each pair of consecutive functions, give a brief justification on why they are in this order. For e.g., if you ordered $A<B<C$, you need to justify that $A<B$ and $B<C$.

$$
\begin{gathered}
6 n \lg n, 2^{100}, \lg \lg n, \lg ^{2} n, 2^{\lg n}, 2^{2^{n}}, \sqrt{n}, n^{0.01}, 1 / n, 4 n^{3 / 2}, \\
3 n^{0.5}, 5 n, 2 n \lg ^{2} n, 2^{n}, n \log _{4} n, 4^{n}, n^{3}, n^{2} \lg n, 4^{\lg n}, 4^{\lg n}, \sqrt{\lg n}
\end{gathered}
$$

2. (GT C-1.9) Give an example of a positive function $f(n)$ such that $f(n)$ is neither $O(n)$ nor $\Omega(n)$.
3. (GT C-1.11) Describe a method for finding both the minimum and the maximum of $n$ numbers with fewer than $3 n / 2$ comparisons.
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[^0]:    *Collaboration is allowed, even encouraged, provided that the names of the collaborators are listed along with the solutions. Write up the solutions on your own.

