Asymptotic Notation: Omega and Theta

When we want to say that a function is large, we use the Omega notation. For example, we can say that any comparison-based sorting algorithm must perform $\Omega(n \log n)$ comparisons.

Definition We say that $f(n) = \Omega(g(n))$ if $g(n) = O(f(n))$.

For example, $n^3 = \Omega(n^2)$.

Definition We say that $f(n) = \Theta(g(n))$ if $f(n) = O(g(n))$ and $g(n) = O(f(n))$.

For example, $56n^2 - 8n + 5 = \Theta(n^2)$ and $\log(n!) = \Theta(n \log n)$.