

$f = \Theta(g)$ f grows at the same rate as g There exists an n_0 and constants $c_1, c_2 > 0$ such that for all $n > n_0$, $c_1 g(n) \leq |f(n)| \leq c_2 g(n)$.

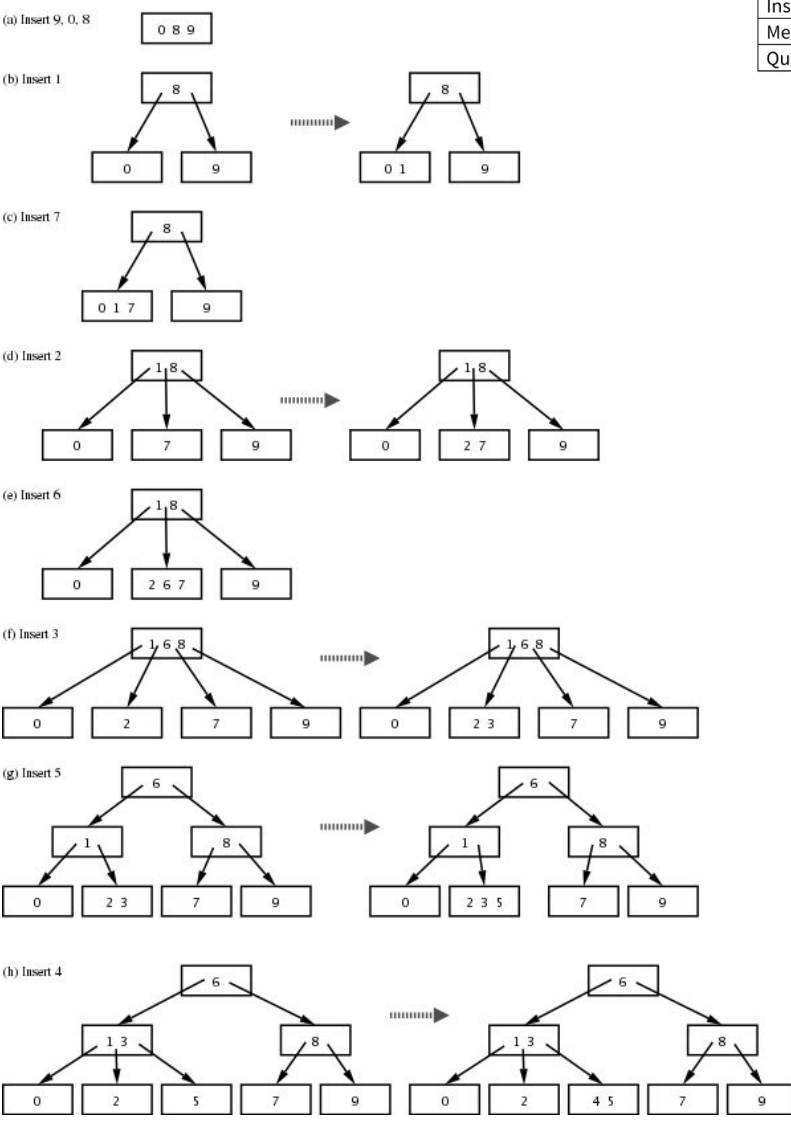
$f = O(g)$ f grows no faster than g There exists an n_0 and a constant $c > 0$ such that for all $n > n_0$, $|f(n)| \leq c g(n)$.

$f = \Omega(g)$ f grows at least as fast as g There exists an n_0 and a constant $c > 0$ such that for all $n > n_0$, $c g(n) \leq |f(n)|$.

$f = o(g)$ f grows slower than g For all $c > 0$, there exists an n_0 such that for all $n > n_0$, $|f(n)| \leq c g(n)$.

$f = \omega(g)$ f grows faster than g For all $c > 0$, there exists an n_0 such that for all $n > n_0$, $c g(n) \leq |f(n)|$.

$f \sim g$ f/g approaches 1 $\lim_{n \rightarrow \infty} f(n)/g(n) = 1$



Data structure	Access	Insert	Delete	Search	Traverse
Linear					
Array	$O(1)$	$O(1)$	$O(n)$	$O(n)$	$O(n)$
Ordered array	$O(1)$	$O(n)$	$O(n)$	$O(\log n)$	$O(n)$
Linked list	$O(n)$	$O(1)$	$O(n)$	$O(n)$	$O(n)$
Matrix	$O(1)$	$O(1)$	$O(1)$	$O(m \cdot n)$	$O(m \cdot n)$
Stack	$O(1)$	$O(1)$	$O(1)$	$O(n)$	$O(n)$
Queue	$O(1)$	$O(1)$	$O(1)$	$O(n)$	$O(n)$
Sort	Best	Avg	Worst	Space	Stable
Bubble sort	$O(n)$	$O(n^2)$	$O(n^2)$	$O(1)$	Yes
Selection sort	$O(n^2)$	$O(n^2)$	$O(n^2)$	$O(1)$	No
Insertion sort	$O(n)$	$O(n^2)$	$O(n^2)$	$O(1)$	Yes
Merge sort	$O(n \log n)$	$O(n \log n)$	$O(n \log n)$	$O(n)$	Yes
Quick sort	$O(n \log n)$	$O(n \log n)$	$O(n^2)$	$O(\log n)$	No

