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# Big O Notation

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## BIG O NOTATION

### FAMILY OF BACHMANN-LANDAU NOTATIONS

Name	Notation
Big O(micron)	$\mathcal{O}$ or $O$
Big Omega	$\Omega$
Big Theta	$\Theta$
Small O(micron)	$o$
Small Omega	$\omega$
On the order of	$\sim$

### FORMAL DEFINITIONS

$T(N) = O(f(N))$  if there are positive constants  $c$  and  $n_0$  such that  $T(N) \leq cf(N)$  when  $N \geq n_0$

$T(N) = \Omega(g(N))$  if there are positive constants  $c$  and  $n_0$  such that  $T(N) \geq cg(N)$  when  $N \geq n_0$

$T(N) = \Theta(h(N))$  if and only if  $T(N) = O(h(N))$  and  $T(N) = \Omega(h(N))$

$T(N) = o(p(N))$  if  $T(N) = O(p(N))$  and  $T(N) \neq \Theta(p(N))$