Hierarchy of Asymptotic Complexities of Some Basic Functions

all depending on n as variable

↑ growing slower

Class	*Name*		*Remarks*	*Suitability*
1	constant		sin(n), cos(n) ∈ O(1)	usually suitable for big problems
$\log_b(\log_b(n))$			value of b does not matter	
$\log_b(n)$	logarithmic		value of b does not matter	
$(\log_b(n))^k$ where $k > 1$	polylogarithmisch		value of b does not matter	
n^k where $0 < k < ½$		polynomial	$= \sqrt[a]{n^b}$ where $k = b/a$	
$\sqrt[2]{n} = n^{0.5}$			$= n^{½}$	
n^k where $½ < k < 1$			$= \sqrt[a]{n^b}$ where $k = b/a$	
n	linear			
$n \cdot \log(n)$ where $n > 1$	quasi-linear / log-linear		$\log(n!) \in \Theta(n \cdot \log(n))$	
n^k where $1 < k < 1.5$		polynomial		
$n \cdot \sqrt[2]{n}$			$= n^{1.5}$	
n^k where $1.5 < k < 2$				
n^2	quadratic			usually unsuitable for big problems
n^k where $2 < k < 3$				
n^3	cubic			
n^k where $k > 3$				
$n^{\log_b(n)}$	quasi-polynomial	superpolynomial	Value of b does not matter	
k^n where $k > 1$	exponential			
$(n/k)^n$ where $k > 3$			$= n^n / k^n$	
n!	factorial		$n! \underset{n\to\infty}{\approx} \sqrt[2]{2 \cdot \pi \cdot n} \cdot (n/e)^n$	
$(n/k)^n$ where $k \leq 2$				
n^n			corresponds to $(n/k)^n$ where $k = 1$	

growing faster ↓