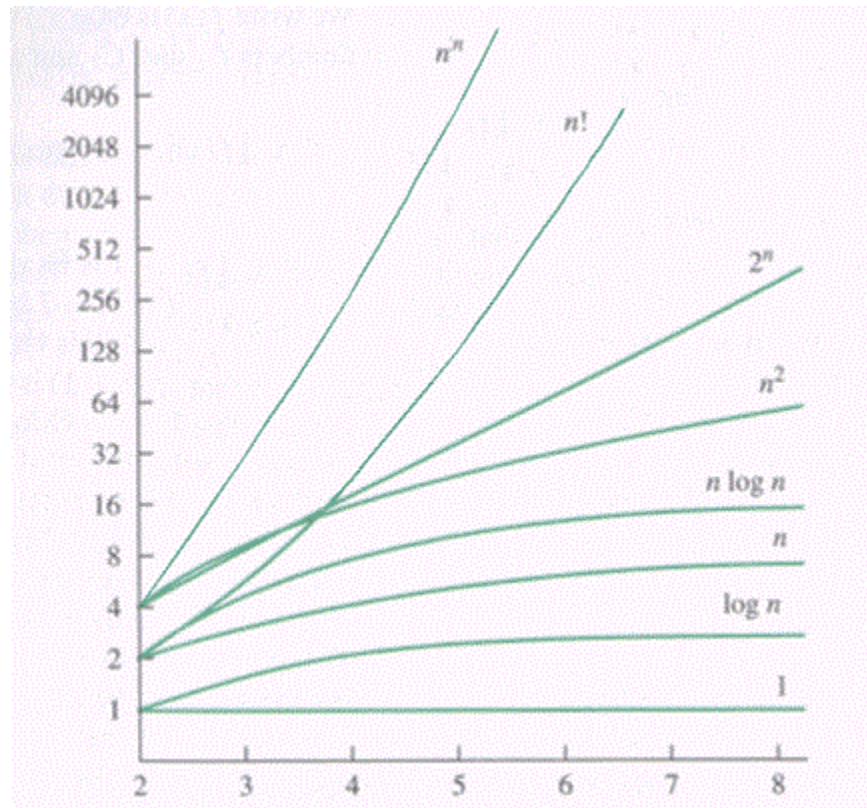


# IIND 4115 – Flujo en Redes

## Asymptotic Complexity



Name	Running time ( $T(n)$ )	Example algorithms
constant time	$O(1)$	Determining if an integer (represented in binary) is even or odd
iterated logarithmic time	$O(\log^* n)$	Distributed coloring of cycles
log-logarithmic	$O(\log \log n)$	Amortized time per operation using a bounded priority queue
logarithmic time	$O(\log n)$	Binary search
fractional power	$O(n^c)$ where $0 < c < 1$	Searching in a kd-tree
linear time	$O(n)$	Finding the smallest or largest item in an unsorted array

linearithmic time	$O(n \log n)$	Fastest possible comparison sort
quadratic time	$O(n^2)$	Bubble sort; Insertion sort; Direct convolution
cubic time	$O(n^3)$	Naive multiplication of two $n \times n$ matrices. Calculating partial correlation.
polynomial time	$2^{O(\log n)} = \text{poly}(n)$	Karmarkar's algorithm for linear programming; AKS primality test
quasi-polynomial time	$2^{\text{poly}(\log n)}$	Best-known $O(\log^2 n)$ -approximation algorithm for the directed Steiner tree problem.
sub-exponential time (second definition)	$2^{o(n)}$	Best-known algorithm for integer factorization and graph isomorphism
exponential time (with linear exponent)	$2^{O(n)}$	Solving the traveling salesman problem using dynamic programming
exponential time	$2^{\text{poly}(n)}$	Solving matrix chain multiplication via brute-force search
factorial time	$O(n!)$	Solving the traveling salesman problem via brute-force search