CSc 227 — Program Design and Development
(McCann)

Common Upper-Bound Functions for Algorithm Analysis

These functions are commonly-used as labels on the 'buckets' into which we categorize algorithms as a simple way to describe their basic efficiencies:

Function	Name	Example Algorithm
1	Constant time	`x = Maze[a][b]`
$\log_2 n$	Logarithmic Time	Binary Search
n	Linear Time	Search a Linked List
$n \cdot \log_2 n$	Log–Linear	Tree Sort (we hope!)
n^2	Quadratic Time	Selection Sort
n^3	Cubic Time	Matrix Multiplication
k^n	Exponential Time	Traveling Salesperson

Plotting these functions is a good step toward understanding their growth rates. Both are plots of the same functions, but the second is logarithmic on the y–axis to help distinguish the faster-growing functions.