

### Common Complexity Classes

$O(1)$	"O of one"	Constant
$O(\log n)$	"O of log n"	Logarithmic
$O(\sqrt{n})$	"O of square root n"	Square Root
$O(n)$	"O of n"	Linear
$O(n \log n)$	"O of n log n"	Linearithmic
$O(n^2)$	"O of n squared"	Quadratic
$O(n^3)$	"O of n cubed"	Cubic
$O(n^4)$	"O of n to the fourth"	Quartic
$O(n^k)$	"O of n to the k"	Polynomial
$O(2^n)$	"O of two to the n"	Exponential
$O(3^n)$	"O of three to the n"	Exponential
$O(c^n)$	"O of c to the n"	Exponential
$O(n!)$	"O of n factorial"	Factorial

### Reading Compound Expressions

$O(n + m)$	"O of n plus m"
$O(n^2 + n)$	"O of n squared plus n"
$O(n^2 \log n)$	"O of n squared log n"
$O(n \log^2 n)$	"O of n log squared n"
$O(n \log \log n)$	"O of n log log n"
$O((n + m)^2)$	"O of quantity n plus m squared"
$O(2^n \times n)$	"O of two to the n times n"

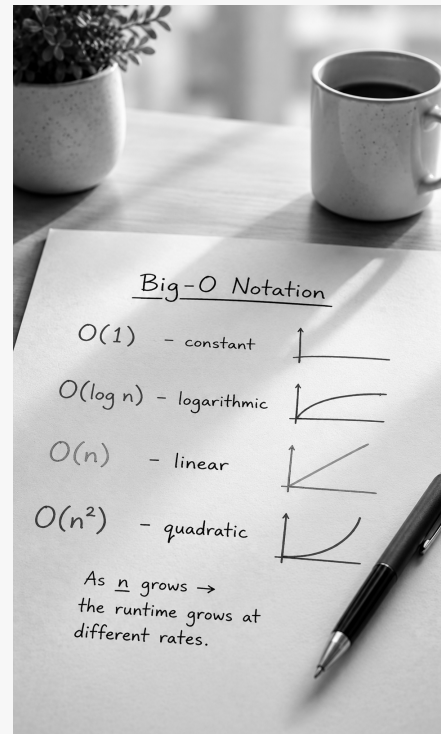
### Simple Rule

- \* If the exponent is attached to n, ... say: "n squared," "n cubed," or "n to the ..."
- \* If the exponent is attached to a number, ... say: "two to the n," "three to the n," etc.

### Examples:

- \*  $n^2 \rightarrow$  "n squared"
- \*  $n^3 \rightarrow$  "n cubed"
- \*  $2^n \rightarrow$  "two to the n"
- \*  $3^n \rightarrow$  "three to the n"

### Big-O Notation



### Growth Order (Fastest $\Rightarrow$ Slowest)

$O(1)$   
 $O(\log n)$   
 $O(\sqrt{n})$   
 $O(n)$   
 $O(n \log n)$   
 $O(n^2)$   
 $O(n^3)$   
 $O(n^k)$   
 $O(2^n)$   
 $O(n!)$