ASYMPTOTIC NOTATION: -

Asymptotic Notations are languages that allow us to analyse an algorithm’s running time by identifying its behaviour as the input size for the algorithm increases. This is also known as an algorithm’s growth rate.

The **running time** of an algorithm depends on how long it takes a computer to run the lines of code of the algorithm—and that depends on the speed of the computer, the programming language, and the compiler that translates the program from the programming language into code that runs directly on the computer, among other factors.

When we drop the constant coefficients and the less significant terms, we use **asymptotic notation**. We'll see three forms of it: *big-Θ* notation, *big-O* notation, and *big-Ω* notation.

Functions in order of their rate of growth:

1. Constant Functions (Least growth rate): -

* output value is the same for every input value such as, 64, 78, 04, etc.

1. Logarithmic Function: -

* inverses of exponential functions
* the logarithm of a given number *x* is the [exponent](https://en.wikipedia.org/wiki/Exponent) to which another fixed number, the [base](https://en.wikipedia.org/wiki/Base_(exponentiation)) *b*, must be raised, to produce that number *x.*

1. Linear Function: -

* A [function](https://en.wikipedia.org/wiki/Function_(mathematics)) whose [graph](https://en.wikipedia.org/wiki/Graph_of_a_function) is a [straight line](https://en.wikipedia.org/wiki/Straight_line), that is a [polynomial function](https://en.wikipedia.org/wiki/Polynomial_function) of degree at most one.
* 

1. Linearithmic Function: -

* Combines "linear" and "logarithmic" functions
* log "n" (i.e., a [product](http://enacademic.com/dic.nsf/enwiki/15339) of a linear and a logarithmic term).

1. Polynomial Functions: -

* A polynomial in the variable x is a function that can be written in the form,



* involves only the operations of [addition](https://en.wikipedia.org/wiki/Addition), [subtraction](https://en.wikipedia.org/wiki/Subtraction), [multiplication](https://en.wikipedia.org/wiki/Multiplication), and non-negative [integer](https://en.wikipedia.org/wiki/Integer) [exponents](https://en.wikipedia.org/wiki/Exponentiation) of variables.

1. Exponential Functions (Highest growth rate): -

* an **exponential function** is a function of the form



in which the argument *x* occurs as an exponent.