Asymptolic Notations

A laplottim & but sh irrubanum na.

Alphottim & but sh irrubanum na.

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Alphottime sphere

Short Complexity complexity

hand

Definition!

by it a mathematical involutions und to discribe ithe iriunning time of an Algorithm.

> Various Wolatian. (0, 1, 0.

1) Big oh Notation:) It is denoted by O > It represents the upper bound of Algorithm vaining time. > It Takes more time to run on Algorithm. Formula: f(n) < C* g (n'). Diagram crgu).

2). Omega Notation: if it is denoted by _1. > It represents the Lower bound of Algorithm running time. > It takes his time, to run an Algorithm. Formula: f(h) > c * g cm. Diagram: fin) icr gen). 5) Blg theta Notation: > It is denoted by O'. > It is the method the runnly their is between the upper and Louis bound. > It Tales "Awrage thm to oun an Algorithm. $C,*g(n) \leq j(n) \leq c_2 * g(n).$ Formula: blagram 1 C2 & g cn?. -f(n). - cirgen

properties et growth 1. f1(n) vi order et 191(n). 1. 8 - f2'(n) vi 11 11 11 92 (n) then. fr(n) t f2(n) e Oil man(gicn)ig2(n)). 2. Polynomials of dagree in E O (nm) 3. o(1) Lo(logn) Lo(n) Lo(n²) Lo(2n²) 4. Exponential functions an have deferent · orders of growth var different values ofa. Mala, m. in Italy in the contract of

Properties of Assyptotio Matations:

1. baneral properties:

2. Reflerine:

$$f(n) = O(f(n))$$

$$f(n) = n^2 \quad \text{then} \quad f(n) = O(n^2).$$

isimilarly that I without .

$$f(n) = -\Omega(f(n)).$$

$$f(n) = \theta (f(n)).$$

3. Symmetry: f(n) = 0 (g(n)) if any only if g(n) = 0(f(n)).

Eg: $f(n) = n^3$ and $g(n) = n^3$ then. f(n) = 0 (n3) and g(n) = 0 (n3).

4. Friamitivity!

f(n) = O(g(n)) 8 g(n) = O(n(n))thun f(n) = O(h(n)).

5. Transpose ssymmetry:

f(n) = 0 (g(n)) is and only is

g(n) = -2 (f(n)).

(b). fen) = O(g(n)). and. polemen. f (n) = 2 (g (n)). when: sen = p:(gens): this calls and plan content 1) O (fun) + gen)) = man (f(n), gcn). Ciment as the a company to the Control (a) i financipus regionatis To the facility (most of the facility). Chillian - May