

## \* Little - Oh Notation : $o(n)$

- As we know that the Big - Oh notation was giving the upper bound this Little - Oh notation also gonna give the upper bound only.

But, what is the difference? This is not strict upper bound

It is a loose upper bound

Big - Oh

1) if  $f = O(g)$

it means that the growth of  $f$  is no faster than  $g$

$$\therefore f \leq g$$

Little - Oh

$$f = o(g)$$

it means that it is more like a smaller than  $g$

$$\therefore f < g$$

It is strictly slower than  $g$ .

It is more stronger statement

## Maths

If  $f$  is strictly slower than  $g$ , then you can say numerator is slower than denominator, it should give us 0

$$\lim_{n \rightarrow \infty} \frac{f(N)}{g(N)} = 0$$

$$f = N^2$$

$$g = N^3$$

$$\lim_{n \rightarrow \infty} \frac{N^2}{N^3}$$

$$= \lim_{n \rightarrow \infty} \frac{1}{N} = 0$$