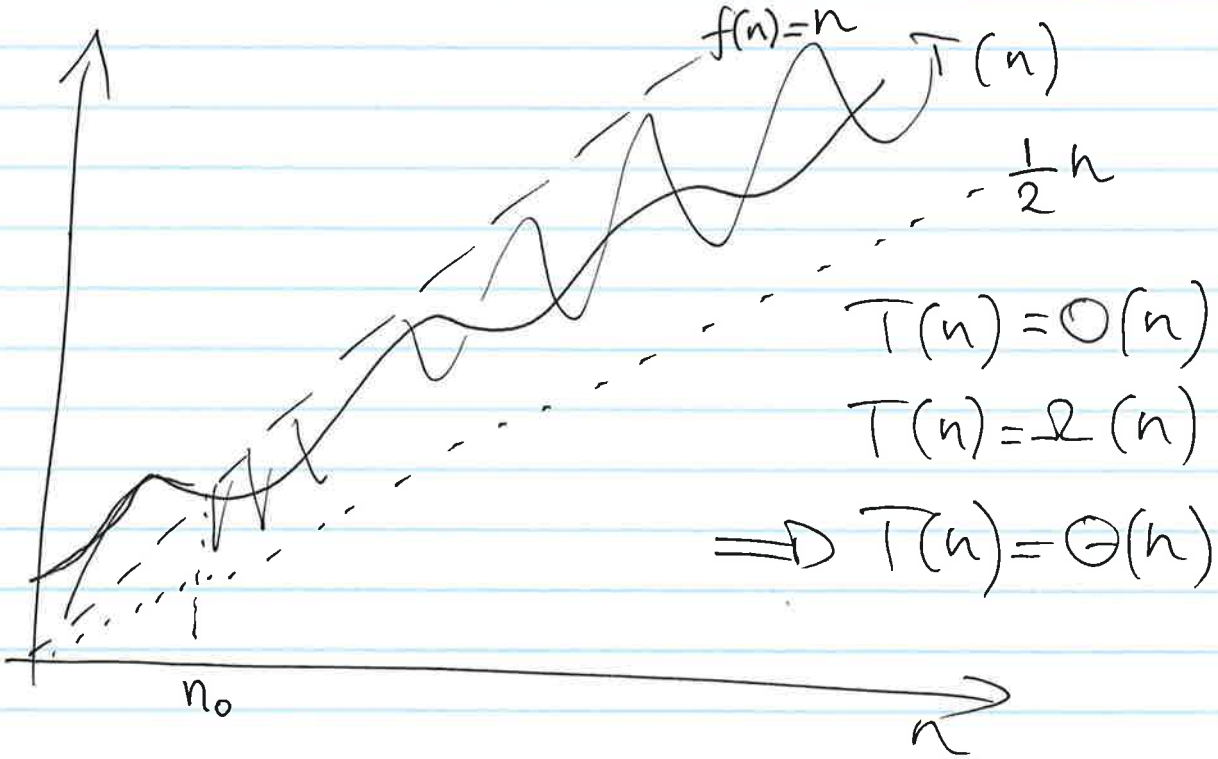
$$\lim_{n\to\infty} \frac{p(2n)}{p(n)} = \lim_{n\to\infty} \frac{a_d 2^d n^d + a_{d-1} 2^{d-1} n^{d-1} + \dots}{a_d n^d + a_{d-1} n^{d-1} + \dots}$$

$$= 2^d$$

linear time $p(x) = a_1 x + a_0$

quadratic time $p(x) = 10x^2 + x - 10$



$T(n) = O(n)$

$T(n) = \Omega(n)$

$\Rightarrow T(n) = \Theta(n)$

O - Omicron say Oh-

Ω Omega say Omega

Θ Theta say Theta

$n! = n(n-1)(n-2)(n-3)(n-4)\ldots.$

Let $T(n)$ be the number of steps of find_optimel_window

want to upper bound $T(n)$

iterations $\leq n^2$

each iteration takes $O(n)$ time

$\Rightarrow T(n) = O(n^3)$

$B[a] - B[b+1] = A[a] + A[a+1] + \ldots\ldots A[n-1]$
$- A[b+1] - A[b+2] \ldots.$

$= A[a] + \ldots + A[b]$

2nd Algorithm

pre-processing $= O(n^2)$

iteration main loops $\leq n^2$
each takes $O(1)$

$\Rightarrow T(n) = O(n^2)$

$$OPT[j] = \operatorname{argmax}_{i \le j} B[i]$$

$$OPT[j] = \begin{cases} j & B[j] > B[OPT[j-1]] \\ OPT[j-1] & \text{o.w} \end{cases}$$