Asymptotic Analysis

Big-Oh: Definition

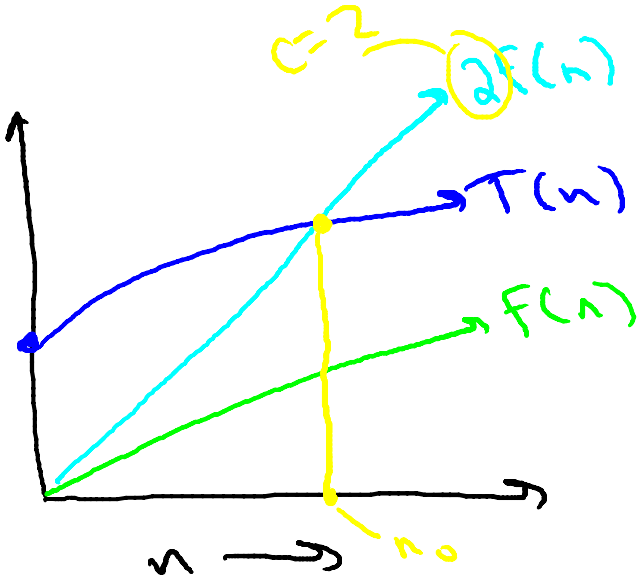
Design and Analysis of Algorithms I

Big-Oh: English Definition

Let T(n) = function on n = 1,2,3,…
[usually, the worst-case running time of an algorithm]

Q : When is T(n) = O(f(n)) ?
A : if eventually (for all sufficiently large n), T(n) is bounded above by a constant multiple of f(n)

Big-Oh: Formal Definition



Picture $T(n) = O(f(n))$

Formal Definition : T(n) = O(f(n)) if and only if there exist constants $c, n_0 > 0$ such that

$$T(n) \leq c \cdot f(n)$$

For all $n \geq n_0$

Warning : c, n_0 cannot depend on n