Projeto e Análise de Algoritmo
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Atividade Avaliativa 03

f(n)	g(n)
n - 100	n - 200
log n	$(log\ n)^2$
log n	$log\ n^2$
2^n	2^{n+1}
n!	2^n
$2n^2 + 5n$	n^2
$2n^2 + 5n$	n^3

f(n) = n - 100 e g(n) = n - 200

$$\lim_{n\to\infty} \frac{f(n)}{g(n)} = \frac{n-100}{n-200} = \frac{\infty}{\infty}$$

$$\lim_{n\to\infty} \frac{(1-\frac{100}{n})}{(1-\frac{200}{n})} = 1$$

f(n) = O(g(n)) e f(n) = Ω(g(n))

f(n) = Θ(g(n)), f(n) ≠ o(g(n)) e f(n) ≠ ω(g(n)).

f(n) = log n e g(n) = $(log\ n)^2$

$$\lim_{n \to \infty} \frac{f(n)}{g(n)} = \frac{\log n}{(\log n)^2} = \frac{1}{\log n} = 0$$

$f(n) \neq \omega(g(n))$ e $f(n) = o(g(n))$

f(n) = O(g(n)), f(n) ≠ Θ(g(n)) e f(n) ≠ Ω(g(n)).

f(n) = log n e g(n) = $\log n^2$

$$\lim_{n \to \infty} \frac{f(n)}{g(n)} = \frac{\log n}{\log n^2} = \frac{\log n}{2\log n} = \frac{1}{2}$$

f(n) = O(g(n)) e f(n) = Ω(g(n))

f(n) = Θ(g(n)), f(n) ≠ o(g(n)) e f(n) ≠ ω(g(n)).

f(n) = 2^n **e g(n) =** 2^{n+1}

$$\lim_{n \to \infty} \frac{f(n)}{g(n)} = \frac{2^n}{2^{n+1}} = \frac{2^n}{2^n * 2} = \frac{1}{2}$$

f(n) = O(g(n)) e f(n) = Ω(g(n))

f(n) = Θ(g(n)), f(n) ≠ o(g(n)) e f(n) ≠ ω(g(n)).

f(n) = n! e g(n) = 2^n

$$\lim_{n \to \infty} \frac{f(n)}{g(n)} = \frac{n!}{2^n} = \frac{n^n}{2^n} = (\frac{n}{2})^n = \infty$$

f(n) = $\omega(g(n))$ e $f(n) \neq o(g(n))$

f(n) ≠ O(g(n)), f(n) ≠ Θ(g(n)) e f(n) = Ω(g(n)).

f(n) = $2n^2 + 5n$ **e g(n) =** n^2

$$\lim_{n\to\infty} \frac{f(n)}{g(n)} = \frac{2n^2 + 5n}{n^2} = \frac{n(2n+5)}{n^2} = \frac{2n+5}{n} = 2 + \frac{5}{n} = 2 + 0 = 2$$

f(n) = O(g(n) e f(n) = **Ω(g(n)**)

f(n) = Θ(g(n)), f(n) ≠ o(g(n)) e f(n) ≠ ω(g(n)).

f(n) = $2n^2 + 5n$ **e g(n) =** n^3

$$\lim_{n\to\infty} \frac{f(n)}{g(n)} = \frac{2n^2 + 5n}{n^3} = \frac{n(2n+5)}{n^3} = \frac{2n+5}{n^2} = \frac{2}{n} + \frac{5}{n^2} = 0 + 0 = 0$$

f(n) ≠ **ω(g(n**)) e f(n) = o(g(n))

f(n) = O(g(n)), f(n) ≠ Θ(g(n)) e f(n) ≠ Ω(g(n)).