



August 17, 2020

Exercise 1

Which of the following functions are $O(n^2)$? No explanation is required, but you might want to prove your answer to yourself to convince yourself that you are correct.

a) $f_1(n) = \frac{1}{20}n^3 + 4n^2$

b) $f_2(n) = 2n^2 + 13n \rightarrow O(n^2)$

c) $f_3(n) = 7n + 30 \log n$

d) $f_4(n) = \sin(n) + 15$

e) $f_5(n) = n \log(n)$

f) $f_6(n) = 2^{2^{10}}$

g) $f_7(n) = 2^n$

Como Big-O

nadamas toma

en cuenta la maxima

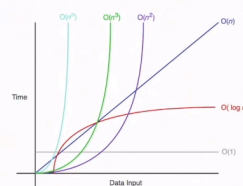
complicación temporal

sin constantes b) ==

 $O(n^2)$ 

orden de complejidad

$O(1)$	Constante
$O(\log(n))$	Logarítmico
$O(n)$	Lineal
$O(n \log(n))$	$n \log(n)$
$O(n^2)$	Cuadrático
$O(n^3)$	Cúbico
$O(n^n)$	Polinomial
$O(m^n)$	Exponencial



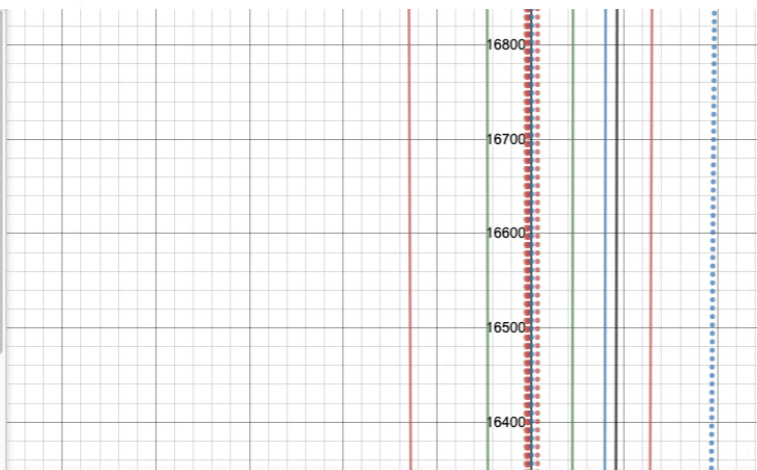
Exercise 2

Which of the following functions are $\Omega(n^2)$? No explanation is required, but you might want to prove your answer to yourself to convince yourself that you are correct.

a) $f_1(n) = \frac{1}{50}n^3 + n^2$

1

1		$f = n^2$	×
2		$g = \left(\frac{1}{50}\right)n^3 + n^2$	×
3		$h = 8n^2 + 6n$	×
4		$j = n2(\sin(n) + 3)$	×
5		$k = n^2 \log(n)$	×
6		$u = n!$	×
7		$l = n^2 \left(\frac{1}{\log n}\right)$	×



b) $f_2(n) = 8n^2 + 6n$

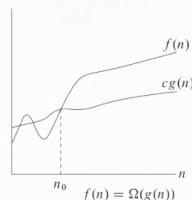
c) $f_3(n) = 7n + 2 \log n$

d) $f_4(n) = n^2(\sin(n) + 3)$

e) $f_5(n) = n^2 \log(n)$

notación Ω (Omega)

- $f(n)$ es $\Omega(g(n))$ si f crece a lo sumo tan rápido como g .
- $f(n)$ es $\Omega(g(n))$ si existe un entero n_0 y una constante $c > 0$, tal que, para todos los enteros $n \geq n_0$ se cumple que: $f(n) \geq cg(n)$.



$$f \in \Omega(g) \text{ si } \lim_{n \rightarrow \infty} \frac{g(n)}{f(n)} < \infty$$