Algorithmics	Student information	Date	Number of session
	UO: 294665	20/02/24	2
	Surname: García Castro		
	Name: Gonzalo		

Escuela de Ingeniería Informática
Universidad de Oviedo

Universidad de Oviedo
Universidá d'Uviéu
University of Oviedo

Activity 1. [Measuring execution times]

Calculate how many more years we can continue using this way of counting.

We can make in java **Long.MAX_VALUE - System.currentTimeMillis()** and then we convert the number to years and its 292,471,208 years.

What does it mean that the time measured is 0?

That the time of the execution is so fast that it can't be measured, so it is not reliable.

From what size of problem (n) do we start to get reliable times?

From 7.000.000 aprox

Activity 2. [Taking small execution times]

What happens with the time if the problem size is multiplied by 2?

As it has a linear complexity, the time will be aprox the previous time *2.

What happens with the time if the problem size is multiplied by a value k other than 2?

The time will be the previous time *k as the algorithm has a linear complexity.

Explain whether the times obtained are those expected from the linear complexity O(n)

An algorithm with a complexity of O(n), or linear complexity, scales in a way that as the input size (n) increases, the time or space required by the algorithm also increases proportionally.

Algorithmics	Student information	Date	Number of session
	UO: 294665	20/02/24	2
	Surname: García Castro		
	Name: Gonzalo		

matches1: O(n^2) as it has two for loops anidated

matches2: O(n) as it only iterates just one time.

maximum: O(n) as it only iterates with just one for loop.

sum: O(n) as it only uses one for loop.

Time in the measurements is expressed in seconds.

N	Tsum	Tmaximum
1000	0,052	0,052
2000	0,087	0,085
4000	0,166	0,163
8000	0,356	0,334
16000	0,697	0,660
320000	1,392	1,299
640000	2,752	2,619
1280000	5,890	5,208
2560000	14,803	10,244
5120000	22,915	20,349
10240000	43,445	40,792
20480000	Oot	Oot
40960000	Oot	Oot
81920000	Oot	Oot

Algorithmics	Student information	Date	Number of session
	UO: 294665	20/02/24	2
	Surname: García Castro		
	Name: Gonzalo		

N	Tmatches1	Tmatches2
1000	696	0,054
2000	2728	0,092
4000	10862	0,174
8000	43761	0,336
16000	Oot	0,677
320000	Oot	1,354
640000	Oot	2,733
1280000	Oot	5,530
2560000	Oot	10,722
5120000	Oot	21,333
10240000	Oot	42,504
20480000	Oot	Oot
40960000	Oot	Oot
81920000	Oot	Oot

Procesor: Intel(R) Core(TM) i5-1035G1 CPU @ 1.00GHz 1.19 GHz

Ram: 16,0 GB