Algorithmics	Student information	Date	Number of session
	UO:300717	06/02/2025	1
	Surname: Almoina Iglesias		
	Name: Martín		

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Activity 1.

"currentTimeMilis()" uses a long(64 bits) to store miliseconds so it can return a maximum value of 18446744073709551616ms or 584,942,417 years since the timer starts at 1970 so it should be usable for 529,942417 years.

Activity 2.

Why does the measured time sometimes come out as 0?

The program might take less than a millisecond to execute.

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

With a size of over 15000000 the execution time is almost always larger than 50 miliseconds.

Activity 3.

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

The execution time is also multiplied by 2.

What happens with time if the problem size is multiplied by a value k other than 2? (try it, for example, for k=3 and k=4 and check the times obtained)

The execution time will be (roughly) multiplied by k.

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

Since the sum of all the arguments in a vector is an algorithm with linear complexity, it is expected that as the size of the vector is multiplied by a number k the execution time would also be multiplied by that number k.

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From what we saw in Vector4.java measuring the times for sum,

create the following three Java classes:

- **Vector5.java to measure times for maximum.**
- **Vector6.java to measure times for matches1.**
- **Vector7.java to measure times for matches2. With the times obtained from the previous classes (in milliseconds), fill in the following two tables:**

Repetitions = 10000				
n	Tsum	Tsum(s)	Tmaximum	Tmaximum(s)
1000	41	0,041	64	0,064
2000	80	0,08	115	0,115
4000	80	0,08	223	0,223
8000	316	0,316	444	0,444
16000	639	0,639	880	0,88
32000	1271	1,271	1768	1,768
64000	2564	2,564	3544	3,544
128000	5176	5,176	7261	7,261
256000	10275	10,275	14302	14,302
512000	20110	20,11	28816	28,816
1024000	39653	39,653	57446	57,446
2048000	78907	78,907	114823	114,823
4096000	162904	162,904	230351	230,351
8192000	320457	320,457	466216	466,216

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Repetitions =	1		1000	
n	Tmatches1	Tmatches1(s)	Tmatches2	Tmatches2(s)
1000	15	0,015	15	0,015
2000	198	0,198	36	0,036
4000	788	0,788	54	0,054
8000	1017	1,017	106	0,106
16000	6124	6,124	217	0,217
32000	20852	20,852	357	0,357
64000	62443	62,443	859	0,859
128000	164887	164,887	1595	1,595
256000	530090	530,09	3380	3,38
512000	2015581	2015,581	7038	7,038
1024000			12949	12,949
2048000			26212	26,212
4096000			52304	52,304
8192000			104857	104,857