Algorithmics	Student information	Date	Number of session
	UO:294515	10/02/2025	2
	Surname: Lopez Garcia		
	Name: Oscar		

Escuela de Ingeniería Informática
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Activity 1. [Measuring execution times]

Maximum value of the currentMilis() is 2^64-1 ms as it uses a long number (64) bits which is the same as 584542046.09 years. Since the time started counting in 1970, 55.15 years have passed, there are still 584541991.1 years remaining.

Activity 2.

If the program takes less than a milisecond to execute, the output will be zero.

If n>=1300000 we start getting reliable values as outputs are greater tan 50ms.

Activity 3. [TITLE OF THE ACTIVITY]

If the problem size is multplied by 2, the execution time is also multiplied by 2. The same happens with k times, the execution time is multiplied by k.

The times grow as expected as the grow by a factor of two.

n	TSum(ms)	Tmax(ms)	Tmatches1(ms)	Tmatches2(ms)
10000	0.039	0.06	514	0.0061
20000	0.076	0.121	2017	0.122
40000	0.151	0.233	8049	0.236
80000	0.302	0.461	32516	0.473
160000	0.604	0.925	129191	0.954
320000	1.220	1843	OoT	1.886
640000	2.456	3.675	OoT	3.761

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1280000	4.867	7.348	OoT	7.392
2560000	9.97	14.773	OoT	14.741
5120000	19.99	29.741	OoT	29.529
10240000	40.64	61.201	OoT	59.194
20480000	80.25	116.661	OoT	OoT
40960000	158.15	233.352	OoT	OoT
81920000	316.72	456.4	OoT	OoT

These results meet what was expected as we can see that all of them have a linear complexity, and grow by a factor of two, except for matches 1, that has a quadratic complexity $O(n^2)$.

CPU: 12th Gen Intel(R) Core(TM) i5-12400 2.50 GHz
RAM: 16,0 GB