Algorithmics	Student information	Date (DD/MM/YYYY)	Number of session
	UO: UO300535	30-01-2025	0
	Surname: Cabo Stroup		
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Activity 1. Factor 1 (problem size)

The first table for PythonA1.py looks like this (times in milliseconds):

n	PythonA1
10000	1595
20000	6292
40000	24976
80000	OoT
160000	OoT
320000	OoT
640000	OoT

Activity 2. Factor 2 (computer power)

The second table, where we compare the algorithm's performance on two different computers, is as follows:

n	PythonA1	
10000	1595	1792
20000	6292	7405
40000	24976	29087
80000	OoT	OoT
160000	OoT	OoT
320000	OoT	OoT
640000	OoT	OoT
	At School	At Home

The computer at school has an i7 processor and 16GB of RAM, whereas my laptop at home is equipped with an AMD Ryzen 9 6900HX processor and 32GB of RAM. We can see the school computer is slightly faster, perhaps since it has more CPU cores, but not to the point of being statistically significant.

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Activity 3. Factor 3 (implementation environment)

The execution times for JavaA1.java are the following:

n	JavaA1
10000	69
20000	255
40000	993
80000	4008
160000	16030
320000	64524
640000	255379

We can see that they are much lower than those in Python, since Java is a lot faster as a language. Python is higher level, and thus less efficient.

Activity 4. Factor 4 (algorithm that is used)

The full table with all the requested times is this:

	Time (ms)									
n	PythonA1		PythonA2	PythonA3	JavaA1		JavaA2		JavaA3	
10000	1595	1792	194	96	69	452	9	50	5	33
20000	6292	7405	702	355	255	1462	28	182	14	122
40000	24976	29087	2583	1304	993	5678	103	624	53	514
80000	OoT	OoT	9602	4807	4008	23762	380	2395	189	1920
160000	OoT	OoT	35912	17966	16030	92946	1427	9340	704	6621
320000	OoT	OoT	OoT	OoT	64524	OoT	5352	34536	2672	23812
640000	OoT	OoT	OoT	OoT	255379	OoT	20264	125310	10081	86406
	At School	At Home			Optimized	Not Opt.	Optimized	Not Opt.	Optimized	Not Opt.

From this data we can conclude that the most important factors are the programming language, optimization (in the case of Java), and the algorithm used. In this case Java is faster than Python, optimization is better than no optimization, and the last algorithms are more efficient than the first ones.