Activity 1. Factor 1: Problem size

N	A1 (Python)
10000	2942 ms
20000	10324 ms
40000	41350 ms
80000	Oot
160000	Oot
320000	Oot
64000	Oot

Activity 2. Factor 2: computer performance

N	A1 (Python) (computer 1)	A1 (Python) (computer 2)
10000	2942 ms	4377 ms
20000	10324 ms	15943 ms
40000	41350 ms	58588 ms
80000	Oot	Oot
160000	Oot	Oot
320000	Oot	Oot
64000	Oot	Oot

Computer 1:

- CPU: Intel® Core™ I7-4790 CPU @ 3.60 GHz
- RAM: 8.0 GB DDR3

Computer 2:

- CPU: AMD Ryzen 7 5800H with Radeon Graphics

Algorithmics	Student information	Date	Number of session
	UO: 295180	01/02/24	0
	Surname: Orviz Viesca		
	Name: Mario		

- RAM: 16.0 GB

Activity 3. Factor 3: Implementation environment

These measures were taken with my personal laptop (CPU: AMD Ryzen 7 5800H with Radeon Graphics; RAM: 16.0 GB),

N	A1 (Python)	A1 (Java)
10000	4377 ms	992 ms
20000	15943 ms	4127 ms
40000	58588 ms	17084 ms
80000	Oot	Oot
160000	Oot	Oot
320000	Oot	Oot
64000	Oot	Oot

As it can be seen, the same algorithm in Java is faster than the python one

Activity 4. Factor 4: algorithm that is used

As these measures were taken with my personal laptop (CPU: AMD Ryzen 7 5800H with Radeon Graphics; RAM: 16.0 GB), the measures for A1 are different from the ones before

N	A1 (Python)	A2 (Python)	A3 (Python)
10000	4377 ms	471 ms	261 ms
20000	15943 ms	1565 ms	941 ms
40000	58588 ms	6053 ms	3633 ms
80000	Oot	22082 ms	12890 ms
160000	Oot	Oot	48302 ms

320000	Oot	Oot	Oot
64000	Oot	Oot	Oot

Java implementations WITHOUT OPTIMIZATION:

N	JavaA1	JavaA2	JavaA3
10000	992 ms	119 ms	82 ms
20000	4127 ms	502 ms	322 ms
40000	17084 ms	1709 ms	1098 ms
80000	Oot	6487 ms	4321 ms
160000	Oot	25062 ms	15549 ms
320000	Oot	Oot	59518 ms
64000	Oot	Oot	Oot

Java implementations WITH OPTIMIZATION:

N	JavaA1	JavaA2	JavaA3
10000	79 ms	13 ms	6 ms
20000	299 ms	32 ms	16 ms
40000	1191 ms	120 ms	61 ms
80000	4768 ms	443 ms	223 ms
160000	19178 ms	1661 ms	834 ms
320000	Oot	6287 ms	3136 ms
64000	Oot	30360 ms	16823 ms

	Student information		Date	Number of session
Algorithmics	UO: 295180		01/02/24	0
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	Name: Mario			

Comparison:

N	A1 (.py)	JavaA1 (No opt)	JavaA1 (opt)	A2 (.py)	JavaA2 (no opt)	JavaA2 (opt)	A3 (.py)	JavaA3 (no opt)	JavaA3 (opt)
10000	4377	992	79	471	119	13	261	82	6
20000	15943	4127	299	1565	502	32	941	322	16
40000	58588	17084	1191	6053	1709	120	3633	1098	61
80000	Oot	Oot	4768	22082	6487	443	12890	4321	223
160000	Oot	Oot	19178	Oot	25062	1661	48302	15549	834
320000	Oot	Oot	Oot	Oot	Oot	6287	Oot	59518	3136
64000	Oot	Oot	Oot	Oot	Oot	30360	Oot	Oot	16823

As it can be clearly seen for all cases, both java programs (with and without optimization) are faster than the python one, but the optimized version of the Java program is way better than the non optimized one