Algorithmics	Student information	Date	Number of session
	UO: 299751	29/01/2025	0
	Surname: Rodriguez Fernandez		
	Name: Marcos		

Escuela de Ingeniería Informática
Universidad de Oviedo

Universidad de Oviedo
Universidá d'Uviéu
University of Oviedo

Activity 1. [Factor 1: problem size]

N	Time(s)
10000	1,518
20000	6,289
40000	25,770
80000	OoT
160000	OoT
320000	OoT
640000	OoT

Activity 2. [Factor 2: computer performance]

Lab	N	10000	20000	40000	80000	160000	320000	640000
RAM:16GB	Time	1,518	6,289	25,77	OoT	OoT	OoT	OoT
CPU: 2.5GHz								

Home	N	10000	20000	40000	80000	160000	320000	640000
RAM:16GB	Time	2.272	9.162	39.389	OoT	OoT	OoT	OoT
CPU: 1.8GHz								

Activity 3. [Factor 3: implementation environment]

PYTHON	N	10000	20000	40000	80000	160000	320000	640000
	Time	2.272	9.162	39.389	OoT	OoT	OoT	OoT

JAVA	N	10000	20000	40000	80000	160000	320000	640000
	Time	0.17	0.689	2.748	10.756	44.542	OoT	OoT

Algorithmics	Student information	Date	Number of session
	UO: 299751	29/01/2025	0
	Surname: Rodriguez Fernandez		
	Name: Marcos		

Activity 4. [Factor 4: algorithm that is used]

PythonA1	**N**	10000	20000	40000	80000	160000	320000	640000
	Time	2.272	9.162	39.389	OoT	OoT	OoT	OoT
PythonA2	**N**	10000	20000	40000	80000	160000	320000	640000
	Time	0.276	0.990	3.775	14.863	54.695	OoT	OoT
PythonA3	**N**	10000	20000	40000	80000	160000	320000	640000
	Time	0.134	0.489	1.880	7.227	28.007	OoT	OoT

WITH OPTIMIZATION

JavaA1	**N**	10000	20000	40000	80000	160000	320000	640000
	Time	0.17	0.689	2.748	10.756	44.542	OoT	OoT
JavaA2	**N**	10000	20000	40000	80000	160000	320000	640000
	Time	0.020	0.072	0.267	0.999	3.752	14.263	53791
JavaA3	**N**	10000	20000	40000	80000	160000	320000	640000
	Time	0.012	0.038	0.139	0.518	1.937	7.326	28.674

WITHOUT OPTIMIZATION

JavaA1	**N**	10000	20000	40000	80000	160000	320000	640000
	Time	0.169	0.678	2.699	10.804	43.039	OoT	OoT
JavaA2	**N**	10000	20000	40000	80000	160000	320000	640000
	Time	0.022	0.073	0.268	1.004	3.757	14.199	53.626
JavaA3	**N**	10000	20000	40000	80000	160000	320000	640000
	Time	0.011	0.039	0.143	0.520	1.941	7.360	27.750

Algorithmics	Student information	Date	Number of session
	UO: 299751	29/01/2025	0
	Surname: Rodriguez Fernandez		
	Name: Marcos		

Conclusion

After having measured the execution times from the different algorithms in the proposed scenarios, I have reached my conclusion about the efficiency of each one and their main differences.

First, the difference between the two coding languages, Java and Python, is very noticeable. Given the execution times of the same algorithm, in the same computer, but changing the language, it can be seen that the one programmed in Java is much faster than the one executed in Python. As far as I know, this is because Java is a compiled language, what makes it take less time to execute a code.

However, using Java, the times are not always the same. In this project we tested two different approaches : “WITHOUT OPTIMIZATION” times obtained without using the JIT and “WITH OPTIMIZATION” those times obtained using the JIT. JIT is a tool that optimizes the program by “eliminating” useless code parts. I appreciated a difference in the execution times between the previously mentioned, this is that using the JIT is slightly faster. This difference is way smaller than the other one, but it may be interesting for longer projects, where any second matters.