Algorithmics	Student information	Date	Number of session
	UO: UO294067	31/02/24	0
	Surname: Díaz Álvarez		
	Name: Paula		

Activity 1. Factor 1 (problem size)

PythonA1	
n	**time (milliseconds)**
10000	1478
20000	5972
40000	25201
80000	OoT
160000	OoT
320000	OoT
640000	OoT

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Activity 2. Factor 2 (computer power)

Computer 1		**Computer 2**	
Processor	12th Gen Intel(R) Core(TM) i7-1255U, 1700 Mhz, 10 procesadores principales, 12 procesadores lógicos	*Processor*	Procesador Intel(R) Core(TM) i7-4790 CPU @ 3.60GHz, 3601 Mhz, 4 procesadores principales, 8 procesadores lógicos
RAM installed	16,0 GB	*RAM installed*	8,00 GB
n	**time**	**n**	**time**
10000	1478 milliseconds	10000	2417 milliseconds
20000	5972 milliseconds	20000	10005 milliseconds
40000	25201 milliseconds	40000	39984 milliseconds
80000	OoT	80000	OoT
160000	OoT	160000	OoT
320000	OoT	320000	OoT
640000	OoT	640000	OoT

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Activity 3. Factor 3 (implementation environment)

n	time (milliseconds)		
	PythonA1	JavaA1 (Not Optimized)	JavaA1 (Optimized)
10000	1478	309	74
20000	5972	1165	264
40000	25201	4632	1054
80000	OoT	18157	4216
160000	OoT	OoT	16725
320000	OoT	OoT	OoT
640000	OoT	OoT	OoT

Java is much faster than Python even when it’s not optimized

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Activity 4. Factor 4 (algorithm that is used)

n	time (milliseconds)		
	PythonA1	PythonA2	PythonA3
10000	1478	394	149
20000	5972	1082	463
40000	25201	4115	1814
80000	OoT	12175	6321
160000	OoT	52957	22352
320000	OoT	OoT	OoT
640000	OoT	OoT	OoT

n	time (milliseconds)					
	Without optimizations (-Djava.compiler=NONE)			With optimizations		
	JavaA1	JavaA2	JavaA3	JavaA1	JavaA2	JavaA3
10000	309	38	15	74	25	6
20000	1165	133	81	264	71	21
40000	4632	476	233	1054	252	77
80000	18157	1725	897	4216	614	290
160000	OoT	6565	3373	16725	1954	1088
320000	OoT	26939	12688	OoT	8324	4064
640000	OoT	98578	48094	OoT	30583	15385

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n	time (milliseconds)	
	JavaA4 (Not Optimized)	JavaA4 (Optimized)
10000	0	0
20000	0	0
40000	2	0
80000	2	1
160000	5	1
320000	10	4
640000	15	5
1280000	53	7
2560000	85	16
5120000	155	30
10240000	334	92
20480000	682	240
40960000	1497	609
81920000	2880	1532

I used more values for testing JavaA4 as in the range for n [10000, 640000], the times are so small that are not representative.

We can see that the versions of the program in Python are much slower (even 10 times) than the versions in Java, even when they are not optimized.
The optimized versions in Java are much faster than the ones not optimized.

In version 4, using the Sieve of Eratosthenes is much faster than any version.