Algorithmics	Student information	Date	Number of session
	UO: 294665	20/02/24	3
	Surname: Garcia Castro		
	Name: Gonzalo		

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Activity 1. [Some iterative models]

N	tLoop1	tLoop2	tLoop3	tLoop4
100	0,052	0,051	0,053	0,050
200	0,104	0,192	0,213	0,36
400	0,218	0,905	0,914	2,782
800	0,518	4,112	5,170	22,021
1600	1,127	18,195	17,0	Oot
3200	2,376	Oot	Oot	Oot
6400	5,011	Oot	Oot	Oot
12800	12,584	Oot	Oot	Oot
25600	23,760	Oot	Oot	Oot
51200	51,520	Oot	Oot	Oot

Complexity:

Loop 1 (n^2 * log^3(n))

Loop 2(log3(n) * n^2)

Loop 3(n^2 * log2(n))

Loop 4(n^3)

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Activity 2. [Creation of iterative models]

N	tLoop5	tLoop6	tLoop7
100	0,054	0,049	0,066
200	0,261	0,398	0,974
400	1,323	4,306	14,026
800	6,525	37,874	Oot
1600	32,238	Oot	Oot
3200	Oot	Oot	Oot
6400	Oot	Oot	Oot

Complexity:

Loop 5 (O(n^2 * log2n))

Loop 6 (O(n^3 * log(n)))

Loop 7 (O(n^4))

Activity 3. [Comparison of two algorithms]

Loop1:

```
n      time   repetions    counter
100    98     10000        603
200    204    10000        1340
400    435    10000        2937
800    1023   10000        6942
1600   2195   10000        14938
3200   4699   10000        32010
6400   10006  10000        68272
12800  22604  10000        153612
25600  47503  10000        324273
```

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Loop2:

```
n      time   repetions    counter
100    70     200          25500
200    254    200          101000
400    1306   200          482400
800    7801   200          2245600
1600   30609  200          8971200
```

The time of both loops is expressed in time(ms) per repetition

n	tLoop1	tLoolp2	t1/t2
100	0,0098	0,35	0,028
200	0,0204	1,27	0,016
400	0,0435	6,53	0,007
800	0,1023	39,005	0,003
1600	0,2195	153,045	0,0014
3200	0,4699	Oot	Oot
6400	1,0006	Oot	Oot
12800	2,2604	Oot	Oot
25600	4,7503	Oot	Oot

Activity 4. [Two algorithms with the same complexity]

Loop3:

```
n      time   repetions    counter
100    126    100          71400
200    522    100          323200
400    2260   100          1447200
800    9799   100          6416000
1600   42127  100          28195200
3200   18088  100          122956800
```

```
Loop2:
n       time    repetions     counter
100     70      200           25500
200     254     200           101000
400     1306    200           482400
800     7801    200           2245600
1600    30609   200           8971200
3200    4991    10            40985600
```

The time of both loops is expressed in time(ms) per repetition

n	L3	L2	t1/t2
100	1,26	0,35	3,6
200	5,22	1,27	4,11
400	22,6	6,53	3,46
800	97,99	39,005	2,51
1600	421,27	153,045	2,75
3200	1808,8	499,1	3,62

Activity 5. [Same algorithm in different development environments]

Loop4 without optimizacion:

```
n       time    repetions     counter
100     50      40            171700
200     361     40            1353400
400     2775    40            10746800
800     21840   40            85653600
```

Loop4 with optimizacion:

```
n       time    repetions     counter
100     227     10000         171700
200     1038    10000         1353400
400     6365    10000         10746800
800     44187   10000         85653600
```

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Loop4 python:

TIME (milliseconds)

n= 100 **time= 7 **counter= 171700

n= 200 **time= 107 **counter= 1353400

n= 400 **time= 413 **counter= 10746800

n= 800 **time= 3889 **counter= 85653600

n= 1600 **time= 28840 **counter= 683947200

The time of all the loops is expressed in time(ms) per repetition

N	tLoop4 (Python)- t41	tLoop4(Java without optimization)– t42	tLoop4 Java with optimization) – t43	t42/t41	t43/t42
100	7	1,25	0,0227	0,178	0,018
200	107	9,025	0,1038	0,043	0.012
400	413	69,375	0,6365	0,168	0.009
800	3889	546	4,4187	0,140	0.008
1600	28840	Oot	Oot	Oot	Oot
3200	Oot	Oot	Oot	Oot	Oot
6400	Oot	Oot	Oot	Oot	Oot