

# Experimental Setup

I used  $N = 10.000, 20.000, 30.000, 40.000, 50.000, 60.000, 70.000, 80.000, 90.000, 100.000$  input size for algorithm 1, 2, 3 and 4. To make a clear graph of the comparison between algorithm 3 and 4, tested them with extra 4 Input sizes 200.000, 300.000, 400.000, 500.000.

I tested all input sizes with 4 different test cases (all are with same input size but generated randomly new inputs).

On the second page there is a table that contains all my tests and their time cost in seconds. With their average I made a new table at the third page. Extra input sized test cases for algorithm 3 and 4 is also included in the last table. Graph of the all algorithms and finally the comparison graph of algorithm 3 and 4 is on the last page. Time measure is second, for all the cases.

# Results:

Input Size (N)	Data Number	algorithm 1	algorithm 2	algorithm 3	algorithm 4
10000	1	93	69	36	32
	2	93	68	36	33
	3	92	67	35	31
	4	93	68	37	32
20000	1	309	209	72	65
	2	309	210	73	65
	3	308	209	76	64
	4	304	210	74	66
30000	1	647	426	110	97
	2	649	425	111	97
	3	649	426	111	96
	4	650	427	112	97
40000	1	1102	705	153	128
	2	1110	708	153	130
	3	1093	706	152	131
	4	1103	706	153	131
50000	1	1692	1074	188	163
	2	1688	1073	190	162
	3	1690	1068	189	163
	4	1691	1076	189	163
60000	1	2395	1497	226	198
	2	2394	1499	225	199
	3	2395	1498	226	198
	4	2392	1500	227	198
70000	1	3223	2003	260	226
	2	3221	2002	262	227
	3	3224	2004	261	227
	4	3223	2003	260	228
80000	1	4110	2550	301	255
	2	4112	2545	300	262
	3	4110	2555	300	256
	4	4109	2551	298	259
90000	1	5168	3205	338	290
	2	5169	3200	339	294
	3	5167	3198	338	292
	4	5168	3210	338	292
100000	1	6350	3917	374	325
	2	6347	3920	375	326
	3	6346	3914	374	326
	4	6348	3920	373	325

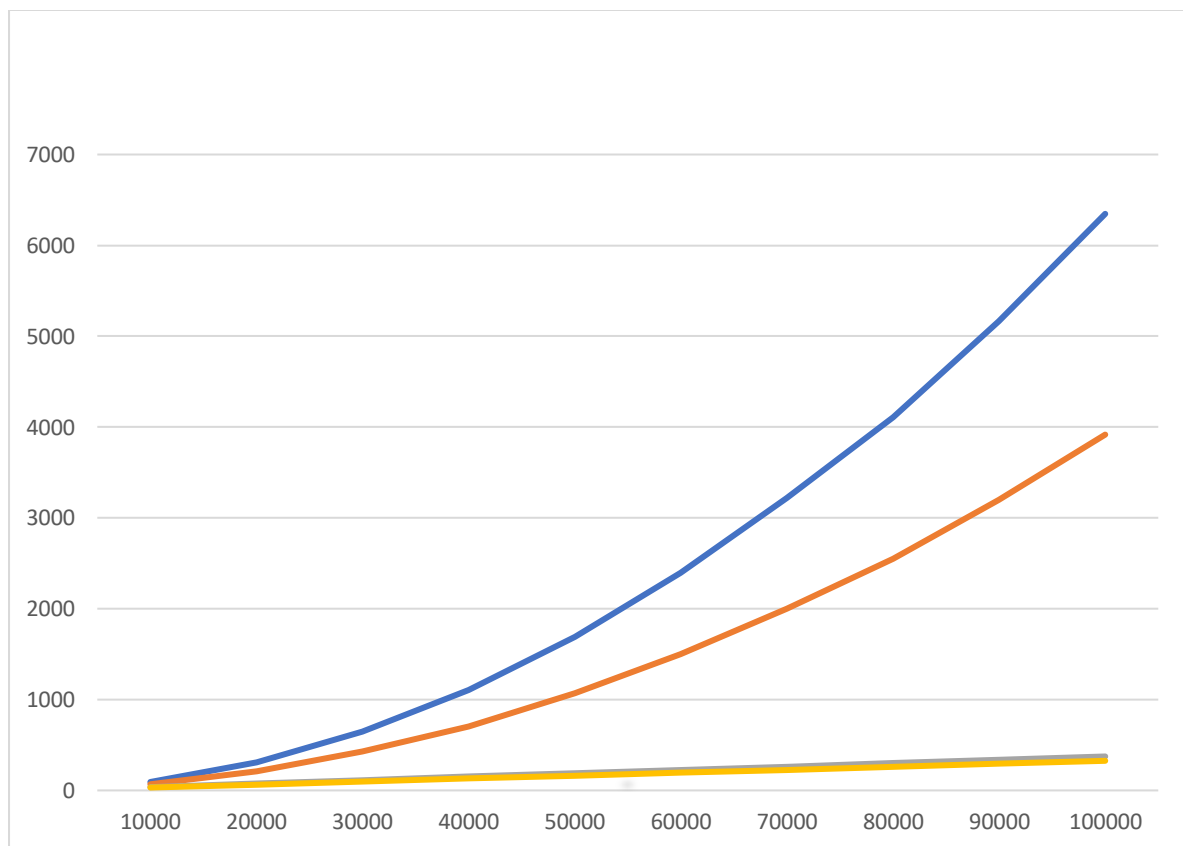
Input size	alg1	alg2	alg3	alg4
10000	93	68	36	32
20000	308	209	74	65
30000	649	426	111	97
40000	1102	706	153	130
50000	1690	1073	189	163
60000	2394	1499	226	198
70000	3223	2003	260	227
80000	4110	2550	300	259
90000	5168	3200	338	292
100000	6347	3917	374	326
200000			753	640
300000			1138	969
400000			1525	1294
500000			1943	1698

Blue: Algorithm 1

Orange: Algorithm 2

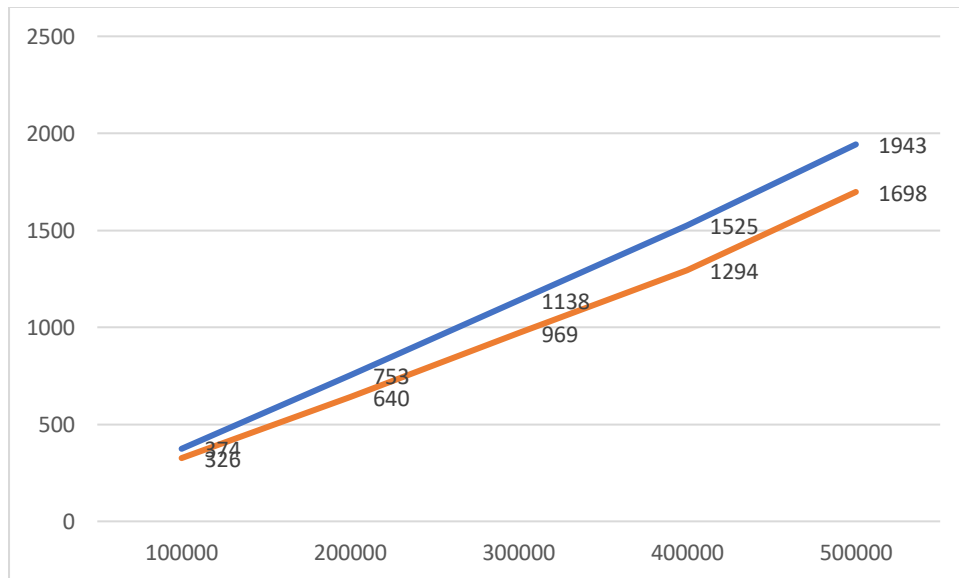
Yellow: Algorithm 3

Green: Algorithm 4



Blue: Algorithm 3

Orange: Algorithm 4



## Discussion:

I didn't tested algorithm 1 and 2 for bigger test cases because of their rapidly increasing execution times. If I tried to test them, they would spend so much time to finish the algorithm. I couldn't noticed the difference between algorithm 3 and 4 on the first graph so tested them with bigger inputs .

Barış Özbaş

S014669