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Program Structures & Algorithms Fall 2021

Assignment No. 2

Task (List down the tasks performed in the Assignment) BenchMark

• Relationship Conclusion:

The efficiency of insertion sort is greatly affected by the order of the initial array. In the best situation (The initial array is ordered), insertion sort is O(n) In the worst situation (The initial array is reversed), insertion sort is $O(n^2)$ When the initial array is random or partially ordered, complexity is $O(n^2)$

• \$Evidence to support the conclusion:

	A	В	C	D	E	F	G	Н	-	J	K	L	M	N	0	P
	Time/ms															
	N=5															
		100	1000	5000	10000	50000										
	Random	0.6	8	64.6	254	4321.2										
	Ordered	0	0	0.2	0	0.4										
	Partial-Ordered	0	0.5	7.8	32.2	841.8										
	Reverse-Ordered	0.8	3.9	87	258.8	6776.6										
				-												
0																
	N=8															
2		100	1000	5000	10000	50000										
	Random	0.5	10.6	59	228.1	4151.3										
	Ordered	0.5	0.0	0	0	0.3										
	Partial-Ordered	0	0.6	10	33	802.5										
	Reverse-Ordered	1	5	103.25	257.7	6519.6										
7	Reverse-Ordered	1	3	103.23	231.1	0319.0										
8																
9																
	N=10															
1	N=10	100	1000	5000	10000	50000										
	Decident.	0.4	9.5	5000 53.7		4447.6										
	Random	0.4		0 0	208.4	0.6										
	Ordered		0.1		0.1											
	Partial-Ordered	0	0.6	9.2	34.2	924.4										
	Reverse-Ordered	1	8.4	88.7	273.5	6601.9										
6																
7																
	N=15															
9		100	1000	5000	10000	50000										
	Random	0.4	6.1	55.6	184.4	3086.9										
	Ordered	0	0	0.06	0	0.4										
	Partial-Ordered	0.06	0.4	15.2	34.8	886										
	Reverse-Ordered	0.4	4.1	67.6	281.8	6767.4										
4																
5																
	N=20															
7		100	1000	5000	10000	50000										
	Random	0.8	5.6	61.25	154.2	4392.2										
9	Ordered	0	0	0	0.05	0.55										
0	Partial-Ordered	0.05	0.7	9.75	30.7	1274.3										
1	Reverse-Ordered	0.35	3.8	65.7	242.5	10112.5										
2																
3																

o Unit tests result:(Snapshot of successful unit test run)

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