Short Project #5 - Report

Group 27

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Quicksort single pivot comparison

WITHOUT DUPLICATES

Array Size	Runtime in ms	
	Partition 1	Partition 2
10k	3	3
100k	26	48
500k	88	120
1 Million	167	220
5 Million	835	1104
10 Million	1747	2228
20 Million	3528	4668
50 Million	9536	11290
100 Million	18932	23683

WITH DUPLICATES

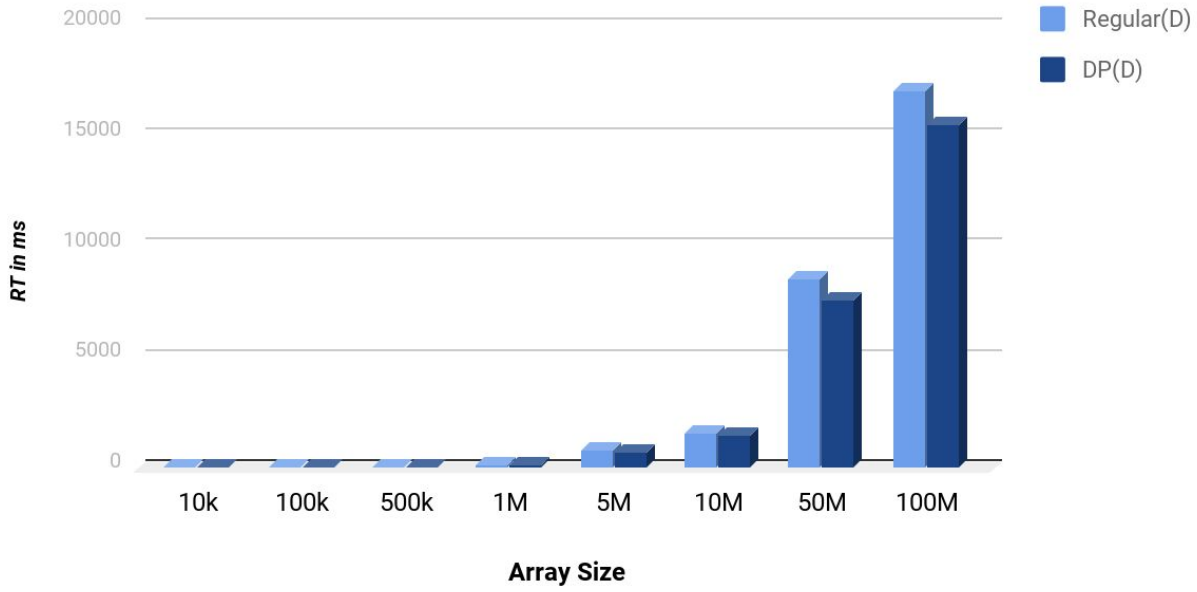
Array Size	Runtime in ms	
	Partition 1	Partition 2
10k	3	4
100k	31	63
500k	91	110
1 Million	174	197
5 Million	832	1039
10 Million	1748	2084
20 Million	3401	4064
50 Million	9456	10482
100 Million	19257	21614

Regular Quicksort vs. Dual-pivot Quicksort

Array Size	Runtime in ms			
	Duplicate Elements		Unique Elements	
	Regular	DP	Regular	DP
10k	3	5	5	7
100k	20	23	19	23
500k	80	82	68	66
1M	155	148	145	135
5M	774	691	690	658
10M	1582	1471	1452	1395
50M	8556	7600	8275	7373
100M	17087	15513	16404	13843

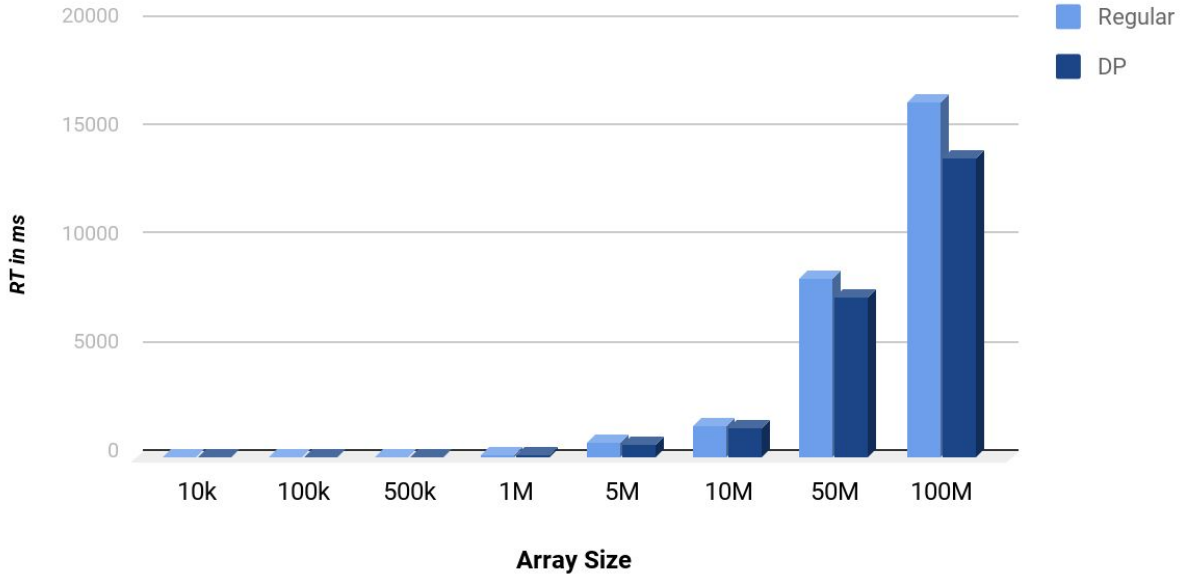
Regular Quick sort vs. Dual-pivot Quick sort (RT in ms)

Array with Duplicate Elements



Regular Quick sort vs. Dual-pivot Quick sort (RT in ms)

Array with unique elements

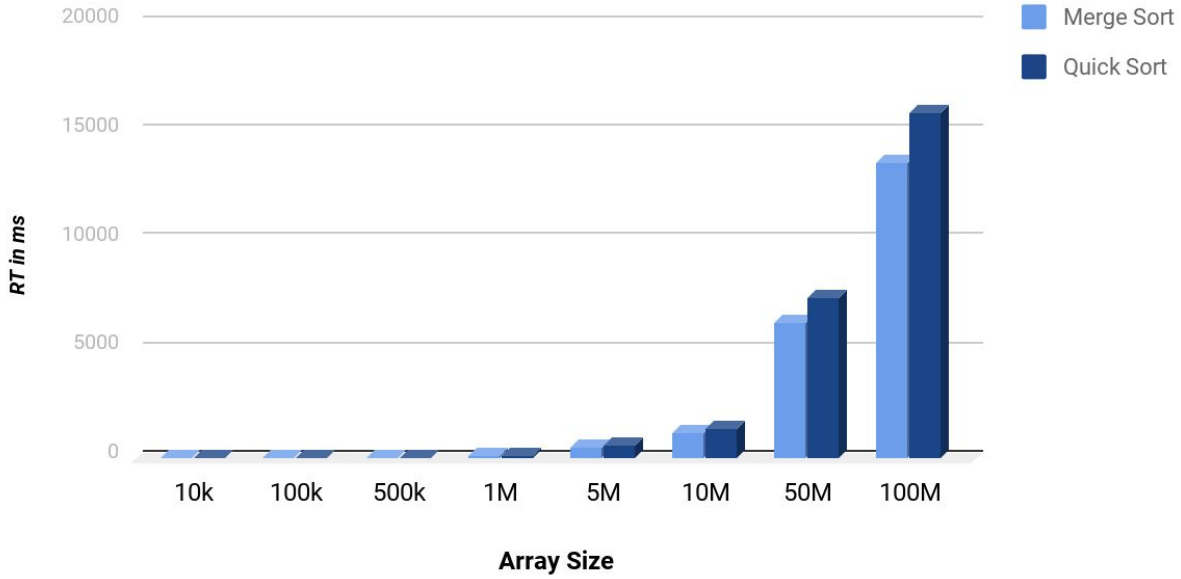


Merge Sort vs. Dual-pivot Quicksort

Array Size	Runtime in ms			
	Duplicate Elements		Unique Elements	
	Merge	Quick	Merge	Quick
10k	5	4	3	5
100k	13	23	24	21
500k	55	61	51	65
1M	106	122	104	127
5M	566	658	576	671
10M	1147	1351	1164	1384
50M	6251	7413	6479	7541
100M	13610	15865	14401	15325

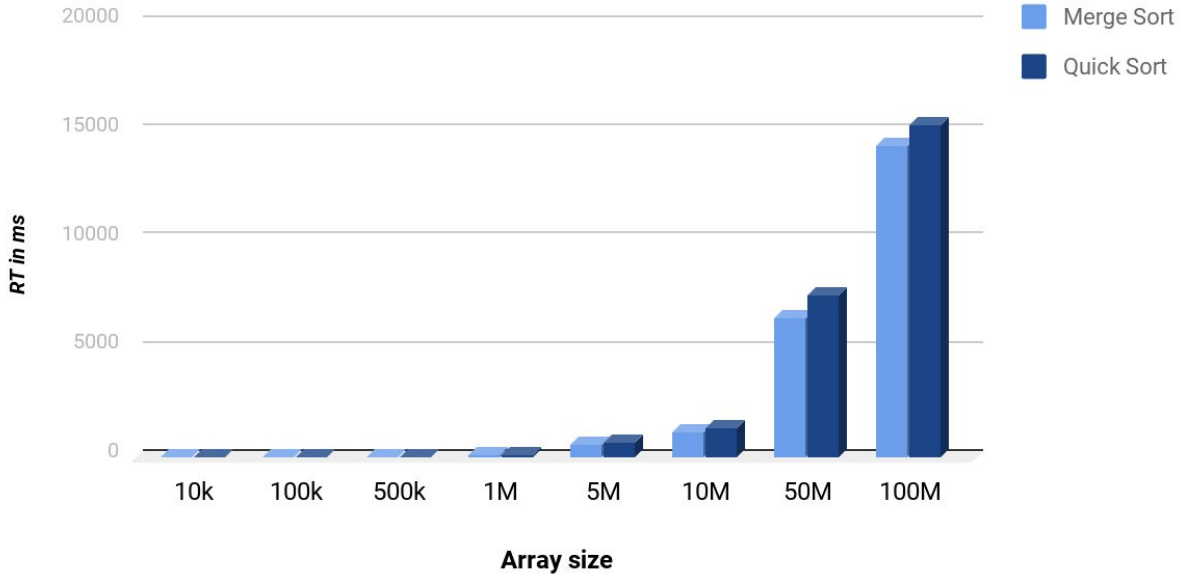
Merge Sort vs. DP Quick Sort

Array with duplicate elements



Merge Sort vs. DP Quick Sort

Array with unique elements



K select Algorithms

Array Size	Runtime in ms		
	Max Heap	Min Heap	Partition
10k (k=200)	4	1	2
100k (k=1k)	10	7	5
500k (k=10k)	30	22	9
1M (k=100k)	86	104	11
5M (k=500k)	1535	986	54
10M (k=1M)	3577	2163	111
10M (k=100k)	2539	194	60
50M (k=5M)	24804	21225	307
50M (k=500k)	16100	1871	219