

OBSERVATION REPORT

The table below shows the time and memory consumed by mergeSorts for various array sizes(power of 2s). As seen in the table, the optimum threshold for take 4 and take 6 can be approximately 65000.

Array Sizes	mergeSort0		mergeSort3		mergeSort4		mergeSort6	
	Time	Memory	Time	Memory	Time	Memory	Time	Memory
16	0 msec	2 MB / 128 MB	0 msec	2 MB / 128 MB	0 msec	2 MB / 128 MB	0 msec	2 MB / 128 MB
32	0 msec	2 MB / 128 MB	0 msec	2 MB / 128 MB	0 msec	2 MB / 128 MB	0 msec	2 MB / 128 MB
64	0 msec	2 MB / 128 MB	0 msec	2 MB / 128 MB	0 msec	2 MB / 128 MB	0 msec	2 MB / 128 MB
128	0 msec	5 MB / 128 MB	0 msec	2 MB / 128 MB	0 msec	2 MB / 128 MB	0 msec	2 MB / 128 MB
256	0 msec	15 MB / 128 MB	0 msec	2 MB / 128 MB	0 msec	2 MB / 128 MB	0 msec	2 MB / 128 MB
512	1 msec	29 MB / 128 MB	0 msec	2 MB / 128 MB	0 msec	2 MB / 128 MB	0 msec	2 MB / 128 MB
1024	1 msec	30 MB / 128 MB	0 msec	2 MB / 128 MB	0 msec	2 MB / 128 MB	0 msec	2 MB / 128 MB
2048	2 msec	17 MB / 185 MB	0 msec	2 MB / 128 MB	0 msec	2 MB / 128 MB	0 msec	2 MB / 128 MB
4096	10 msec	147 MB / 554 MB	0 msec	3 MB / 128 MB	0 msec	3 MB / 128 MB	0 msec	3 MB / 128 MB
8192	25 msec	189 MB / 628 MB	0 msec	4 MB / 128 MB	0 msec	4 MB / 128 MB	0 msec	4 MB / 128 MB
16384	76 msec	16 MB / 503 MB	0 msec	5 MB / 128 MB	0 msec	5 MB / 128 MB	0 msec	5 MB / 128 MB
32768	312 msec	305 MB / 622 MB	1 msec	9 MB / 128 MB	1 msec	8 MB / 128 MB	1 msec	9 MB / 128 MB
65536	1150 msec	73 MB / 736 MB	1 msec	19 MB / 128 MB	1 msec	19 MB / 128 MB	1 msec	19 MB / 128 MB
131072	-	-	3 msec	55 MB / 128 MB	5 msec	6 MB / 128 MB	2 msec	54 MB / 128 MB
262144	-	-	7 msec	55 MB / 128 MB	7 msec	55 MB / 128 MB	6 msec	51 MB / 128 MB
524288	-	-	13 msec	16 MB / 128 MB	16 msec	16 MB / 128 MB	12 msec	55 MB / 128 MB
1,048,576	-	-	29 msec	26 MB / 128 MB	30 msec	26 MB / 128 MB	26 msec	36 MB / 128 MB
2,097,152	-	-	55 msec	46 MB / 128 MB	59 msec	46 MB / 128 MB	52 msec	37 MB / 128 MB

The thresholds 16M, 32M, 64M and 128M successfully sorted the arrays for take3, take4 and take6. The mergeSorts then threw OutOfMemory error for values larger than these.

Algorithm	16M		32M		64M		128M	
	Time	Memory	Time	Memory	Time	Memory	Time	Memory
take 3	872 msec	187 MB / 190 MB	1778 msec	370 MB / 374 MB	3730 msec	736 MB / 863 MB	7719 msec	1468 MB / 1595 MB
take 4	972 msec	187 MB / 190 MB	1963 msec	370 MB / 374 MB	4173 msec	736 MB / 863 MB	6070 msec	1468 MB / 1595 MB
take 6	448 msec	196 MB / 258 MB	990 msec	388 MB / 515 MB	1912 msec	772 MB / 899 MB	4012 msec	1540 MB / 1667 MB