

**Program Structures and Algorithms**  
**Spring 2023(SEC –3)**

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**Task: Assignment 6 (Hits as time predictor)**

**Relationship Conclusion:**

**Merge sort:** From the data gathered from the tests run, the best predictor is copies.

**Heap Sort:** The best predictor for heap sort is observed to be hits.

**Quick sort:** The best predictor for quick sort is observed to be swaps.

**Evidence to support that conclusion:**

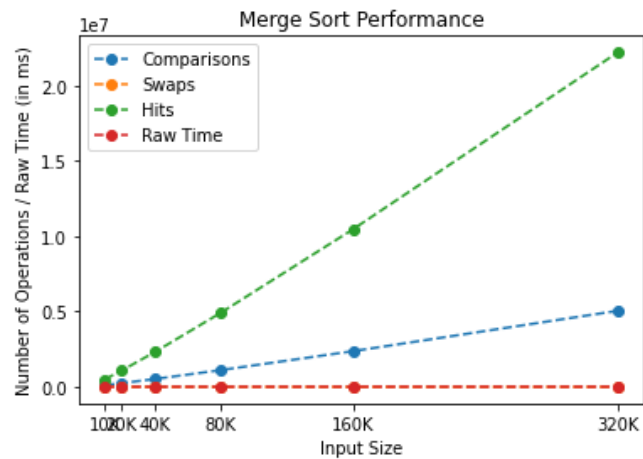
Merge Sort					
Runs	Comparisons	Swaps	Hits	Copies	Raw Time (ms)
10000	108101	0	494524	247262	1.87
20000	234306	0	1068992	534496	3.83
40000	509917	0	2297924	1148962	8.45
80000	1103268	0	4915784	2457892	19.69
160000	2363397	0	10471500	5235750	37.77
320000	5046006	0	22222928	11111464	115.74

Heap Sort					
Runs	Comparisons	Swaps	Hits	Copies	Raw Time (ms)
10000	235429	124334	968194	0	2.87
20000	510715	268432	2095158	0	6.38
40000	1101303	576654	4509222	0	13.78
80000	2363060	1233749	9661116	0	38.37
160000	5046578	2627435	20602896	0	78.95
320000	10731022	5574046	43758228	0	206.68

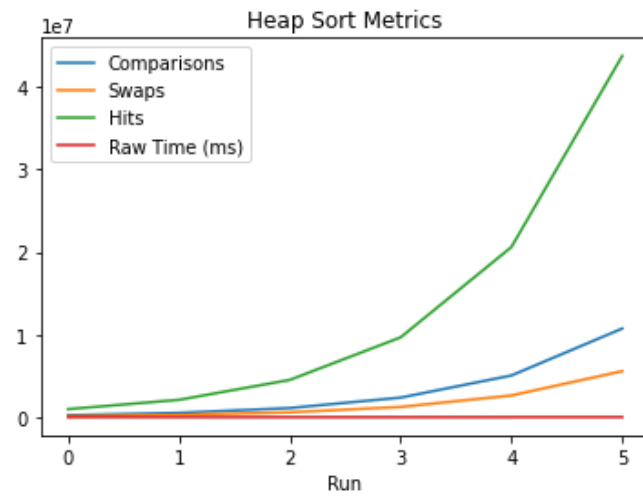
Quick Sort Dual Pivot					
Runs	Comparisons	Swaps	Hits	Copies	Raw Time (ms)
10000	159342	67467	440017	0	2.32
20000	333240	142898	926117	0	4.98
40000	778537	306644	2046719	0	10.26
80000	1599654	710274	4525768	0	25.86
160000	3493449	1389645	9218220	0	52.56
320000	7063722	3047093	19591640	0	118

### Graphical Representation:

#### Merge Sort



## Heap Sort



## Quick Sort Dual Pivot

