

GIT Department of Computer Engineering

CSE 222/505 – Spring 2020

Homework #06 Part 2 Report

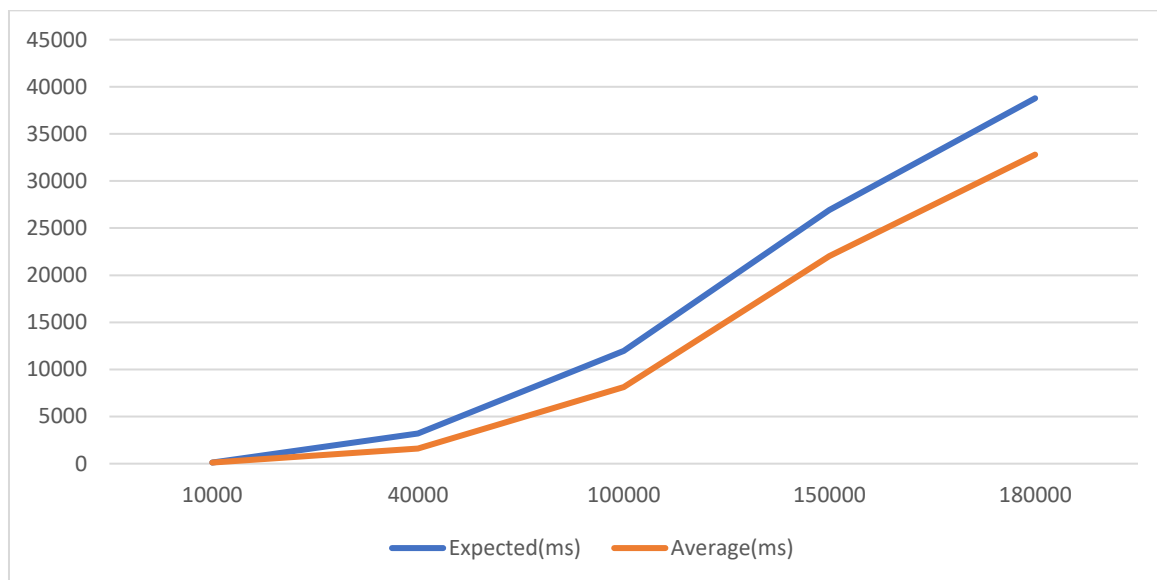
Abdullah ÇELİK

171044002

Selection Sort:

Selection Sort					
Trial	10k	40k	100k	150k	180k
20 Random	120	1651	8321	22667	33791
1 Sorted	114	984	4030	9037	13022
Average	119,7142857	1619,238095	8116,666667	22017,95238	32802

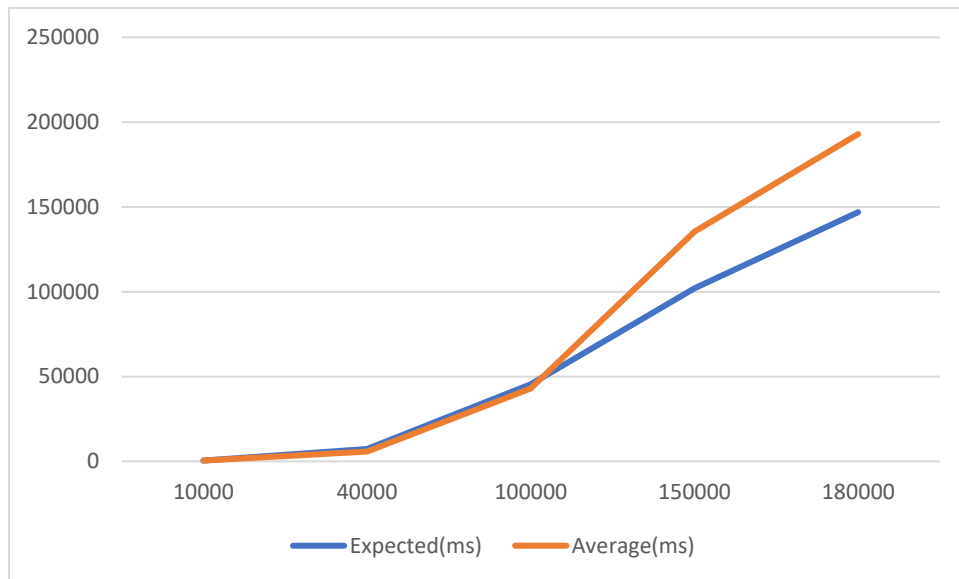
Selection Sort					
Size	10000	40000	100000	150000	180000
Expected(ms)	119,7	3195,2	11970	26932,5	38782,8
Average(ms)	119,7	1619,2	8116,7	22017,95	32802



Bubble Sort:

Bubble Sort					
Trial	10k	40k	100k	150k	180k
20 Random	476	6012	45130	142134	202594
1 Sorted	1	1	1	2	2
Average	453,3809524	5725,761905	42981	135365,8095	192946,7619

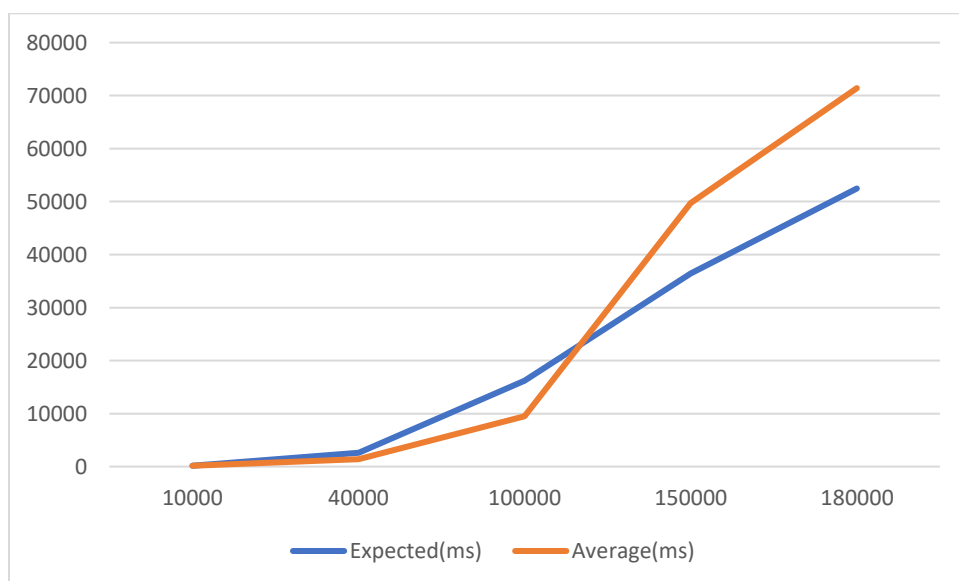
Bubble Sort					
Size	10000	40000	100000	150000	180000
Expected(ms)	453,381	7254,096	45338,1	102010,73	146895,4
Average(ms)	453,381	5725,762	42981	135365,8	192946,8



Insertion Sort:

Insertion Sort					
Trial	10k	40k	100k	150k	180k
20 Random	170	1454	9940	52239	74981
1 Sorted	1	1	1	1	1
Average	161,952381	1384,809524	9466,714286	49751,47619	71410,52381

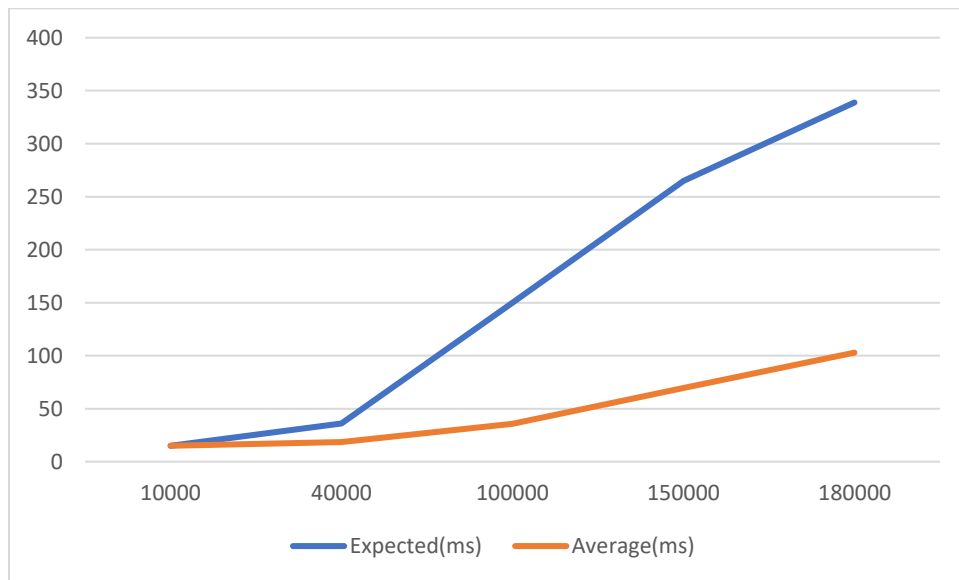
Insertion Sort					
Size	10000	40000	100000	150000	180000
Expected(ms)	161,95	2591,2	16195	36438,75	52471,8
Average(ms)	161,95	1384,81	9466,714	49751,48	71410,52



Shell Sort:

Shell Sort					
Trial	10k	40k	100k	150k	180k
20 Random	15	19	37	72	107
1 Sorted	15	10	8	18	20
Average	15	18,57142857	35,61904762	69,42857143	102,8571429

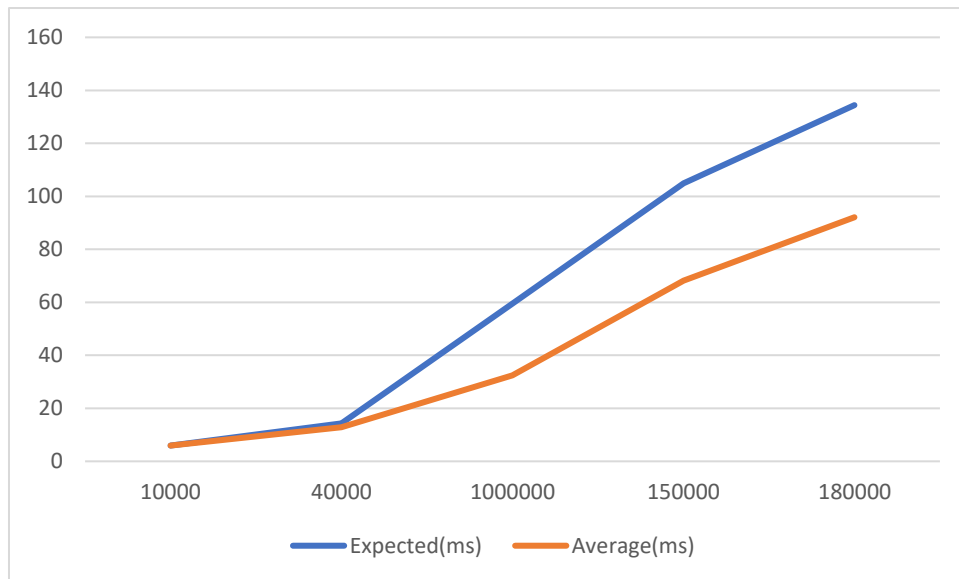
Shell Sort					
Size	10000	40000	100000	150000	180000
Expected(ms)	15	36	150	265	338,85
Average(ms)	15	18,57	35,619	69,429	102,86



Merge Sort:

Merge Sort					
Trial	10k	40k	100k	150k	180k
20 Random	6	13	33	70	95
1 Sorted	5	9	20	33	34
Average	5,952380952	12,80952381	32,38095238	68,23809524	92,0952381

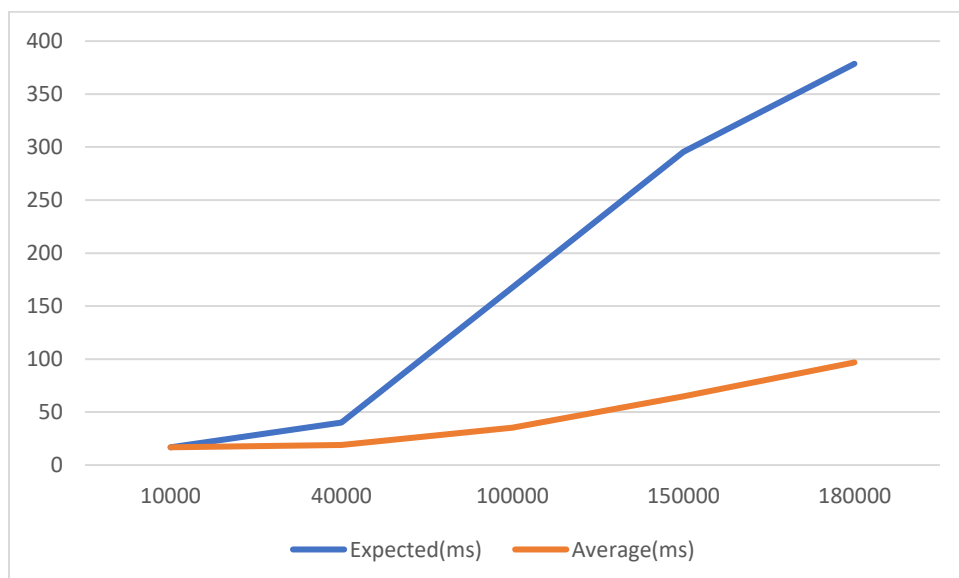
Merge Sort					
Size	10000	40000	100000	150000	180000
Expected(ms)	5,95	14,28	59,5	104,958	134,4105
Average(ms)	5,95	12,81	32,39	68,24	92,1



Heap Sort:

Heap Sort					
Trial	10k	40k	100k	150k	180k
20 Random	17	19	36	64	96
1 Sorted	12	21	23	82	114
Average	16,76190476	19,0952381	35,38095238	64,85714286	96,85714286

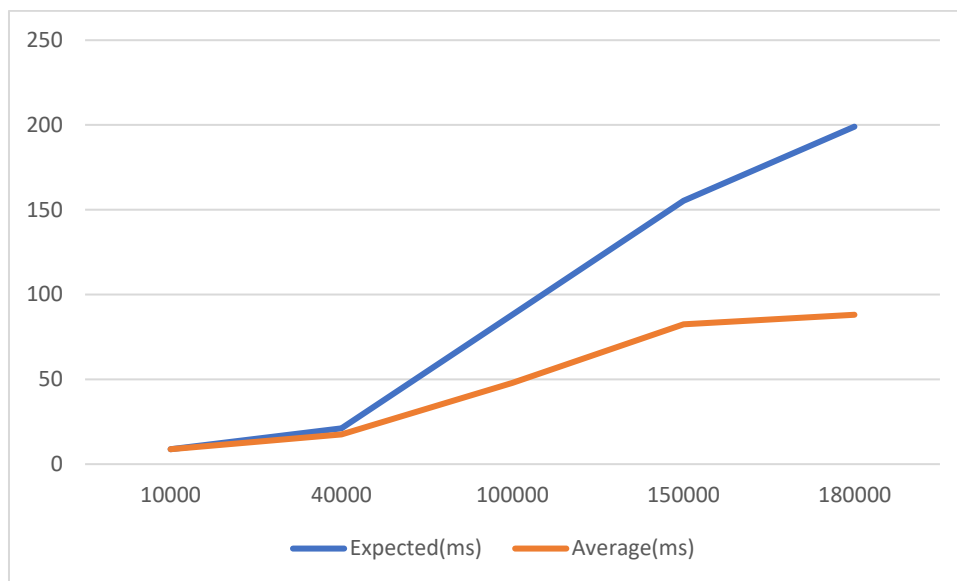
Heap Sort					
Size	10000	40000	100000	150000	180000
Expected(ms)	16,76	40,224	167,6	295,6464	378,61
Average(ms)	16,76	19,1	35,39	64,86	96,86



Quick Sort:

Quick Sort					
Trial	10k	40k	100k	150k	180k
20 Random	9	18	48	86	92
1 Sorted	5	8	48	8	10
Average	8,80952381	17,52380952	48	82,28571429	88,0952381

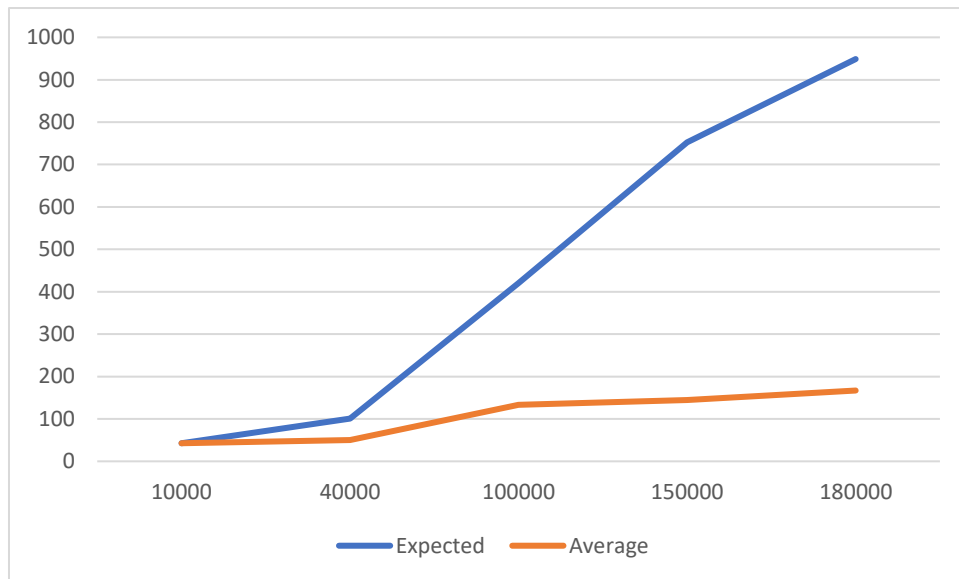
Quick Sort					
Size	10000	40000	100000	150000	180000
Expected(ms)	8,81	21,144	88,1	155,4084	199,0179
Average(ms)	8,81	17,5	48	82,53	88,1



Merge Sort Using Linked List:

Merge Sort Using Linked List					
Trial	10k	40k	100k	150k	180k
20 Random	43	51	136	146	170
1 Sorted	36	39	83	112	107
Average	42,66666667	50,42857143	133,4761905	144,3809524	167

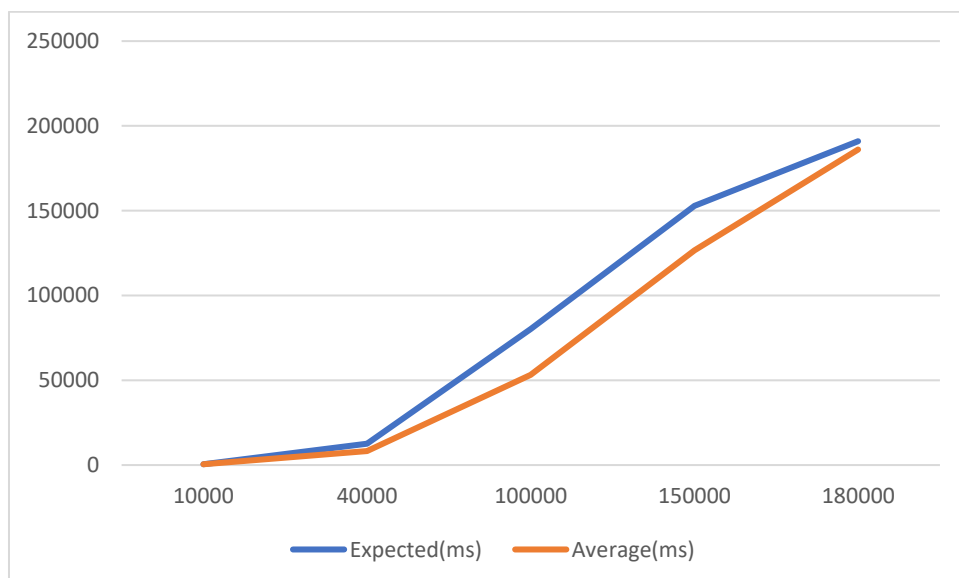
Merge Sort Using Linked List					
Size	10000	40000	100000	150000	180000
Expected(ms)	42,67	100,8	420	752,6	948,79
Average(ms)	42,67	50,43	133,48	144,38	167



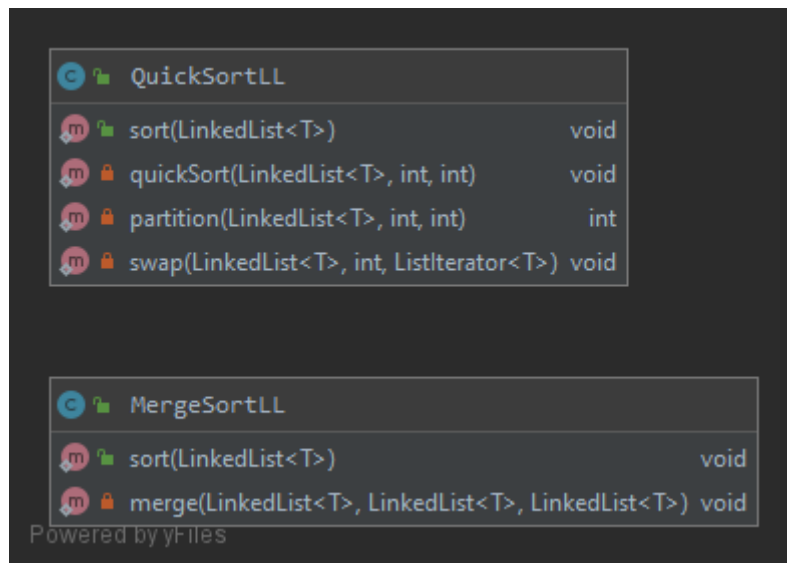
Quick Sort Using Linked List:

Quick Sort Using Linked List					
Trial	10k	40k	100k	150k	180k
20 Random	492	8239	52888	125785	184679
1 Sorted	522	8905	58848	144098	213849
Average	493,4285714	8270,714286	53171,80952	126657,0476	186068,0476

Quick Sort Using Linked List					
Size	10000	40000	100000	150000	180000
Expected(ms)	493,43	12513	80163,9	152876,3	190963,3
Average(ms)	493,43	8270,7	53173,81	126657	186068



Class Diagram



Test Cases

Test ID	Scenerio	Test Data	Expected Results	Actual Results	Pass/Fail
TEST01	Testing MergeSortLL for random linked list	Size : 10	Successfully sorted	As expected	Pass
TEST02	Testing QuickSortLL for random linked list	Size : 10	Successfully sorted	As expected	Pass
TEST03	Testing MergeSortLL for sorted linked list	Size : 10	Successfully sorted	As expected	Pass
TEST04	Testing QuickSortLL for sorted linked list	Size : 10	Successfully sorted	As expected	Pass

Running and Results

TEST01

Before sorting, random linked list is:
[8, -4, -8, -18, 12, 17, 16, -4, 0, 13]
After merge algorithm
[-18, -8, -4, -4, 0, 8, 12, 13, 16, 17]

TEST02

Before sorting, random linked list is:
[-3, 7, -10, 14, 15, -11, 7, 0, 3, 2]
After quick algorithm
[-11, -10, -3, 0, 2, 3, 7, 7, 14, 15]

TEST03

Before sorting, sorted list is:

[0, 1, 2, 3, 4, 5, 6, 7, 8, 9]

After merge algorithm

[0, 1, 2, 3, 4, 5, 6, 7, 8, 9]

TEST04

Before sorting, sorted list is:

[0, 1, 2, 3, 4, 5, 6, 7, 8, 9]

After quick algorithm

[0, 1, 2, 3, 4, 5, 6, 7, 8, 9]