

2) (10 pts) ALG (Sorting)

(a) (6 pts) Consider the array below passed to merge sort. After dividing the full array into the smallest pieces, it will start calling the merge operation. In total, how many times will the merge function will be called for the following array? Show the content of the array right before the last merge operation.

17	12	11	14	15	16	10	13
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Number of merge function calls: **7 (Grading 2 pts, 1 pt for 6 or 8, 0 otherwise)**

Contents of the array right before the last merge function call:

index	0	1	2	3	4	5	6	7
data	11	12	14	17	10	13	15	16

Grading: 2 pts left half, 2 pts right half, only give the 2 pts if the half is completely correct.

(b) (4 pts) List the Big-Oh run-times requested for the following sorting algorithms, in terms of n , the number of items being sorted:

Worst case run-time of quick sort : **$O(n^2)$**

Average case run-time of quick sort : **$O(n \lg n)$**

Worst case run-time of merge sort : **$O(n \lg n)$**

Average case run-time of merge sort : **$O(n \lg n)$**

Grading: 1 pt for each