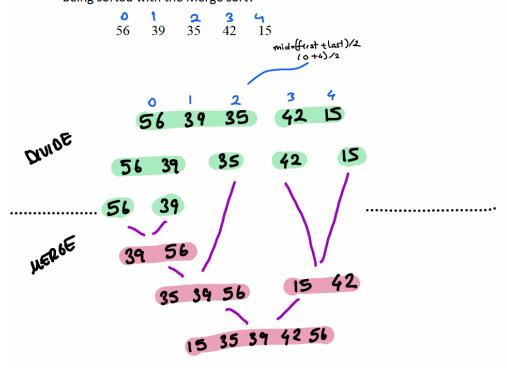
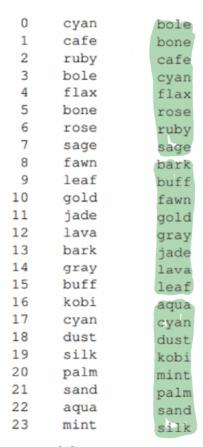
CS 300 Data Structures Problem Set #12 – Faster Sorting Algorithms

1. What are the correct intermediate steps of the following data set when it is being sorted with the Merge sort?



2. What are the correct intermediate steps of the following data set when it is being sorted with the Quick sort?

3. The column on the left is the original input of strings to be sorted; the column on the right is the content at some intermediate step during one of the sorting algorithms listed below. Which sorting algorithm would match with this content?



Original array ?

MELGE - SOLT

2

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4. The column on the left is the original input of strings to be sorted or shuffled; the column on the right are the string in sorted order; the other columns are the contents at some intermediate step during one of the 8 algorithms listed below. Match up each algorithm by writing its number under the corresponding column. Use each number exactly once.

plum blue coal blue coal blue coal cafe corn cafe jade coal gray coal blue corn jade corn pink dusk lime dusk rose gray mint gray herb navy herb teal jade pink jade ruby leaf plum leaf mint lime rose lime mint silk silk silk silk corn plum teal navy bark navy bark navy bark navy wine wine dusk pink dusk leaf ruby leaf ruby leaf plum palm palm palm palm palm palm palm pal				
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2) Selection Sort

3)Insertion Sort

4)Merge Sort

5)Quick Sort

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5. Which sorting algorithm will take least time when all elements of input array are identical? Consider typical implementations of sorting algorithms.

- (a.) Insertion Sort
 - b. Quick Sort O(log N)
 - c. Merge Sort (New N)
 - d. Selection Sort (N)

6. Which of the following sorting algorithms has the lowest worst-case complexity?

- a. Merge Sort
 - b. Insertion Sort
 - c. Quick Sort O(N²)
 - d. Selection Sort O(N2)

7. Suppose we are sorting an array of eight integers using quicksort, and we have just finished the first partitioning with the array looking like this:

2 5 1 7 9 12 11 10

Which statement is correct?

- (a.) The pivot value could be either the 7 or the 9
 - b. The pivot could be the 7, but it is not the 9
 - c. The pivot is not the 7, but it could be the 9
 - d. Neither the 7 not the 9 is the pivot

