Merge Sort

MCQs

PW SKILLS

Q1. Which of the following techniques is used to implement merge sort?

a) nested loops
b) divide and distribute
c) divide and conquer
d) do-while loop

Q2. Which of the following is true about merge sort?

a) We divide the array and keep on sorting the 2 arrays formed in each step.
b) We divide the array until it cannot be divided any further and then merge the two arrays.
c) In each iteration we find the smallest element and swap it with the first unsorted element of the array.
d) We divide the array into two arrays, the first one is the sorted array and the second one is the unsorted array. We then sort the second array and merge the two arrays.

Q3. Given an array [8,5,21,12,9,4], find the number of times the array will be divided before merging any sorted arrays and in how many iterations will the arrays be sorted after they reach the stage after which they cannot be divided further?

a) 2,3
b) 3,3
c) 4,2
d) 5,4

Q4. Which of the following is the correct recurrence relation for merge sort?

a) $T(n) = 2T(n/2) + O(n)$
b) $T(n) = 2T(n/4) + O(n)$
c) $T(n) = T(n/2) + O(n)$
d) $T(n) = 2T(n/2) + O(n/2)$

Q5. Two-way merge sort algorithm is used to sort the following elements in ascending order which takes 2 sorted lists and merges them into a single sorted list.
200, 470, 150, 80, 90, 40, 400, 300, 120, 70
What will be the order of elements after the 2nd pass of merge sort?

a) 40, 80, 90, 150, 200, 300, 400, 70, 120
b) 200, 470, 80, 150, 40, 90, 300, 400, 70, 120
c) 80, 150, 200, 470, 40, 90, 300, 400, 70, 120
d) 40, 70, 80, 90, 120, 150, 200, 300, 400, 470

ANSWERS:

1) c) Divide and Conquer

2) b) We divide the array until it cannot be divided any further and then merge the two arrays.

3) b) 3,3

4) a) T(n) = 2T(n/2) + O(n)

5) c) 80, 150, 200, 470, 40, 90, 300, 400, 70, 120

Explanation:

First pass: (200, 470) (80, 150) (40, 90) (300, 400) (70, 120)

Second pass: (80, 150, 200, 470) (40, 90, 300, 400) (70, 120)