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1) Given an array {7, -2, 5, 3, 10, 5, 2, 8, -3, 6, 7, -4, 1, 9, -9, 0, -6, 8, 11, 9} integers find the maximum and minimum product that can be obtained.

Soln:

1) Sort the array.

Sorted array.

[-9, -8, -6, -5, -4, -3, -2, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11].

⇒ Identify Possible candidates for maximum product.

⇒ Identify possible candidates for minimum product. Calculating maximum product.

* The two largest positive number are And 10 x 11 = 110.
* The two smallest negative numbers are -9 and -8 = 72 by the maximum product = 110.
and minimum product = -99.

2) Demonstrate the priority search method to search for the key = 23 from the array = {2, 5, 8, 12, 16, 23, 38, 56, 72, 91}

given array:

{2, 5, 8, 12, 16, 23, 38, 56, 72, 91}.

1. Initializing pointers.

low = 0 and high = 9.

Calculate mid = $\left[\frac{low + high}{2}\right] = \frac{0+9}{2} = 4$.

Compare arr[mid] with key:

arr[4] = 6.

Since 16 < 23 update low = mid + 1 = 5

Calculate arr[mid] with key:

arr[7] = 56.

Since 56 > 23 update high = mid - 1 = 6.

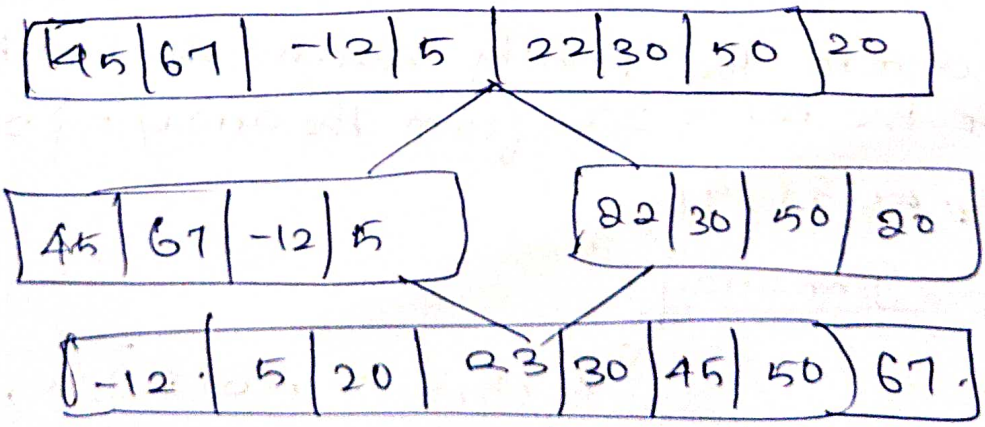
mid = $\left[\frac{5+6}{2}\right] = 5$

arr[mid] = arr(5) = 23.

23 = 23 The is found at index = 5.

3. Apply Merge sort and other list of 8 elements, Data d = { 45, 67, -12, 5, 22, 30, 50, 20), Set up a recursive relation for the number of key comparisions by merge sort.

merge sort:



4) Find the no of times to perform Swapping for selection sort also Estimate the time complexity for the order of rotation set S(12, 7, 5, -2, 8, 10, 13, 4).

The selection sort algorithm always makes Exactly n-1 swaps in the worst case, where n is the no of Element in the list.

given S = {12, 7, 5, -2, 8, 6, 11, 3, 4}.

No of Element, n=8

No of swap n=8 n=1, =7.

time complexity: O(n²).

So the number of swaps is 7, and time complexity is O(n²).

5) Find the index of the target value 10 using binary search from the following list of Elements [2, 4, 6, 8, 10, 2, 14, 16, 18, 20].

Given List = [2, 4, 6, 8, 10, 2, 14, 16, 18, 20]

Value = 10.

Low = 0 and High = 9

$$mid = \frac{low + high}{2} = \frac{0+9}{2}$$

Ex: - list(4) mid = 10; mid = value.

Since 10 == 10 the target is found at index. the target value 10 is found at index 4.