

19 CSE 212 Data Structures and Algorithms – Assignment 1

Array

1. Write a program in Java to search for an element in a sorted array efficiently.
2. Write a program in Java to search for the second occurrence of '6' in an array and replace it with '7'.
3. Write a Java program that uses functions to perform the following operations on array
 - a. Creation
 - b. Insertion (at start, at end, using index, based on value)
 - c. Deletion (at start, at end, using index, based on value)
 - d. Traversal
 - e. Searching an element. (based on value, based on index)
4. Given an array with n numbers split it from a specified position, and move the first part of array and append it to the end.
Example: Given A=[12,10,5,6,22,52] and position =2
Your function should return the modified array as:[5,6,22,52,12,10]
5. Given a sorted array nums, remove the duplicates such that each element appear only once and return the new length.
Example: Given nums = [0,0,1,1,1,2,2,3,3,4]
Your function should return length = 5, with the first five elements being modified as 0, 1, 2, 3, and 4 respectively.
6. Given an array of integers, return indices of the two numbers such that they add up to a specific target. You may assume that each input would have exactly one solution, and you may not use the same element twice.
Example: Given nums = [2, 7, 11, 15], target = 9,
Because $\text{nums}[0] + \text{nums}[1] = 2 + 7 = 9$,
return [0, 1]
7. Given an array nums and a value val, remove all instances of that value in the array and return the new length. The order of elements can be changed.
Example: Given nums = [0,1,2,2,3,0,4,2], val = 2,
Your function should return length = 5, with the first five elements of nums Containing 0, 1, 3, 0, and 4.
8. Given an array of n elements to find if an integer x appears more than n/2 times in a sorted array of n integers.
Example: Given A=[0,1,2,4,4,4,4,4]
Your function should return 4 appears 5 times
Formulate an approach which has a better time complexity
9. Write a Java program to find all the unique triplets such that sum of all the three elements [x, y, z ($x \leq y \leq z$)] equal to a specified number.
Sample array: [1, -2, 0, 5, -1, -4]
Target:2
Output: 1,5,-4

10. Write a Java Program to merge elements of two sorted arrays A and B of size p and q, by maintaining the sorted order i.e. fill A with first p smallest elements and fill B with remaining elements.

Example:

Input :

int[] A = { 1, 5, 6, 7, 8, 10 }

int[] B = { 2, 4, 9 }

Output:

Sorted Arrays:

A: [1, 2, 4, 5, 6, 7]

B: [8, 9, 10]