22AIE 112 Data Structures and Algorithms
Lab Sheet 1
Array

1. Write a program to search for an element in a sorted array efficiently.
2. Write a program to search for the second occurrence of '6' in an array and replace it with '7'.
3. Write a program 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 of nums, remove the duplicates such that each element appears 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 nums[0] + nums[1] = 2 + 7 = 9, then 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

9. Write a 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 :
   intA[] = { 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]