Programs on arrays

#For all the programs, read the n value i.e the number of elements of array and then read the elements of the array

1. Write a C program to find the minimum, maximum and average in an unsorted array of integers.

2. Write a C program to sort the elements of an array of integers in ascending order.

3. Write a program in C to sort elements of the array in descending order.

4. Write a C program to interchange alternate elements in an even sized array
Example: Input array: 1 2 3 4 5 6
Output: 2 1 4 3 6 5

5. Write a C program to reverse the array elements. Result should be updated in same array and do not just the print the values in reverse
Example: Input array: 1 2 3 4 5
Output: 5 4 3 2 1

6. Write a C program to find the kth largest and kth smallest elements in an array.
Example: Input array: 10 17 23 11 9 4 19 , k=2
Output: 2^{nd} smallest is 9 and 2^{nd} largest is 19

7. Write a C program to find the occurrence of a number in a given array of elements.
Example: Input array: 5 7 1 3 8 2 5 9 1 7 1 3, Number k = 1
Output: 3 (Number 1 is present 3 times)

8. Write a C program to delete duplicate elements from an array
Example: Input: 5 1 3 2 4 1 4 3
Output: 5 1 3 2 4

9. Given an array arr[] of size N-1 with integers in the range of [1, N], the task is to find the missing number from the first N integers.
Example: Input: arr[] = {1, 2, 4, 6, 3, 7, 8}, N = 8
Output: 5

10. FInd duplicate elements from the given array
Example: Input : n = 7 and array[] = {1, 2, 3, 6, 3, 6, 1}
Output: 1, 3, 6

11. Given an array of integers arr[], The task is to find the index of first repeating element in it i.e. the element that occurs more than once and whose index of the first occurrence is the smallest.
Examples: Input: arr[] = {10, 5, 3, 4, 3, 5, 6}
Output: 5 (Explanation: 5 is the first element that repeats)
Input: arr[] = {6, 10, 5, 4, 9, 120, 4, 6, 10}
Output: 6 (Explanation: 6 is the first element that repeats)

12. Given an array of integers of size N, find the first non-repeating element in this array.
Examples:

Input: {-1, 2, -1, 3, 0}
Output: 2

Explanation: The first number that does not repeat is : 2

Input: {9, 4, 9, 6, 7, 4}
Output: 6
13. Given an array and a value, find if there is a pair in array whose sum is equal to the given value. If there is such a pair present in array, then print the pair and return true. Else return false. (Note: There might be multiple pairs, print the any one pair)
Example:
Input: array = {12, 3, 4, 1, 6, 9}, sum = 13;
Output: 12, 1 or 4, 9

14. Given an array and a value, find if there is a triplet in array whose sum is equal to the given value. If there is such a triplet present in array, then print the triplet and return true. Else return false.
Examples:

Input: array = {12, 3, 4, 1, 6, 9}, sum = 24;
Output: 12, 3, 9
Explanation: There is a triplet (12, 3 and 9) present
in the array whose sum is 24.
Input: array = {1, 2, 3, 4, 5}, sum = 9
Output: 5, 3, 1
Explanation: There is a triplet (5, 3 and 1) present
in the array whose sum is 9.

15. Find the majority element in the array. A majority element in an array A[] of size n is an element that appears more than n/2 times (and hence there is at most one such element).
Examples :

Input : {3, 3, 4, 2, 4, 4, 2, 4, 4}
Output : 4
Explanation: The frequency of 4 is 5 which is greater than the half of the size of the array size.

Input : {3, 3, 4, 2, 4, 4, 2, 4}
Output : No Majority Element
Explanation: There is no element whose frequency is greater than the half of the size of the array size.

16. Write a program in C to copy the elements of one array into another array.

17. Write a program in C to count and print the frequency of each element of an array

18. Write a program in C to separate odd and even integers in separate arrays. Input one array of both odd and even integers and move them to two separate new arrays.

19. Write a program in C to insert New value in the array (sorted list)

Example:
input the value to be inserted : 8
The exist array list is :
2 5 7 9 11
After Insert the list is :
2 5 7 8 9 11

20. Write a program in C to insert New value in the array (unsorted list)
Input the value to be inserted : 5
Input the Position, where the value to be inserted :2
Input List:
1 8 7 10
After Insert the element the new list is :
1 5 8 7 10

21. Write a program in C for a 2D array of size 3x3 and print the matrix.

22. Write a program in C for addition and subtraction of two Matrices of same size.

23. Write a program in C for multiplication of two square Matrices.

24. Write a program in C to find transpose of a given matrix.

25. Write a program in C to find sum of right diagonals of a matrix.

26. Write a program in C to find the sum of left diagonals of a matrix.

27. Write a program in C to check whether a given matrix is an identity matrix.

28. Write a program in C to find the ceiling in a sorted array.
Note: Given a sorted array in ascending order and a value x, the ceiling of x is the smallest element in array greater than or equal to x, and the floor is the greatest element smaller than or equal to x.

Example:
Input: X value is 5, The given array is : 1 3 4 7 8 9 9 10
Output: The ceiling of 5 is: 7

29. For the given sorted array of integers, print the number of distinct absolute values among the elements of the array.
Example
Input: n = 5, a = {-1 -1 0 1 2}
Output: 3

Input: n = 4, a = {0 0 0 0}
Output: 1

30. Given two array A[0….N-1] and B[0….M-1] of size N and M respectively, representing two numbers such that every element of arrays represent a digit. For example, A[] = { 1, 2, 3} and B[] = { 2, 1, 4 } represent 123 and 214 respectively. The task is to find the sum of both the numbers.

31. Given an array of integers and a number k, write a program that returns true if given array can be divided into pairs such that sum of every pair is divisible by k.
Input :
n=4
a={9 7 5 3}
k=2
Output: True

32. You are given an integer 'n' which denote the number of elements in an array a[ ]and an integer 'x'. You have to calculate the average of element a[i] and x and find out if that number exist in array or not. Do it for all the elements of array and store the count result in another array for each index i.

Examples:
Input : n=5 x=2 a={2 4 8 6 2}
Output: 2 0 0 1 2

Input : n=6 x=3 a={9 5 2 4 0 3}
Output: 0 1 1 1 0 1

33. Given a stream of numbers, print average or mean of the stream at every point.

Examples:
Input: n=5, a={10 20 30 40 50}
Output: 10 15 20 25 30

Input: n=2, a={12 , 2}
Output: 12, 7

34. Given an array of even size, task is to find minimum value that can be added to an element so that array become balanced. An array is balanced if the sum of the left half of the array elements is equal to the sum of right half.

N = 6, a={1 2 1 2 1 3}
Output: 2
Explanation: Suppose, we have an array 1 2 1 2 1 3. The Sum of first three elements is 1 + 2 + 1 = 4 and sum of last three elements is 2 + 1 + 3 = 6
So this is unbalanced, to make it balanced the minimum number we can add is 2 to any element in first half.