Array

Note: Solve Atleast 10-15 Questions

1. Write a program in C to store elements in an array and print them. Computer programming bootcamps
Test Data :
Input 10 elements in the array :
element - 0 : 1
element - 1 : 1
element - 2 : 2
.....
Expected Output :
Elements in array are: 1 1 2 3 4 5 6 7 8 9

2. Write a program in C to read n number of values in an array and display them in reverse order.
Test Data :
Input the number of elements to store in the array :3
Input 3 number of elements in the array :
element - 0 : 2
element - 1 : 5
element - 2 : 7
Expected Output :
The values store into the array are :
2 5 7
The values store into the array in reverse are :
7 5 2

3. Write a program in C to find the sum of all elements of the array.
Test Data :
Input the number of elements to be stored in the array :3
Input 3 elements in the array :
element - 0 : 2
element - 1 : 5
element - 2 : 8
Expected Output :
Sum of all elements stored in the array is : 15

4. Write a program in C to copy the elements of one array into another array.
Test Data :
Input the number of elements to be stored in the array :3
Input 3 elements in the array :
element - 0 : 15
element - 1 : 10
element - 2 : 12
Expected Output :
The elements stored in the first array are :
15 10 12
The elements copied into the second array are :
15 10 12

5. Write a program in C to count the total number of duplicate elements in an array.
Test Data :
Input the number of elements to be stored in the array :3
Input 3 elements in the array :
element - 0 : 5
element - 1 : 1
element - 2 : 1
Expected Output :
Total number of duplicate elements found in the array is : 1

6. Write a program in C to print all unique elements in an array.
Test Data :
Print all unique elements of an array:

Input the number of elements to be stored in the array: 4
Input 4 elements in the array :
element - 0 : 3
element - 1 : 2
element - 2 : 2
element - 3 : 5
Expected Output :
The unique elements found in the array are:
3 5

7. Write a program in C to merge two arrays of the same size sorted in descending order.
Test Data :

Input the number of elements to be stored in the first array :3
Input 3 elements in the array :
element - 0 : 1
element - 1 : 2
element - 2 : 3
Input the number of elements to be stored in the second array :3
Input 3 elements in the array :
element - 0 : 1
element - 1 : 2
element - 2 : 3
Expected Output :
The merged array in decending order is :
3 3 2 2 1 1

8. Write a program in C to count the frequency of each element of an array.
Test Data :
Input the number of elements to be stored in the array :3
Input 3 elements in the array :
element - 0 : 25
element - 1 : 12
element - 2 : 43
Expected Output :
The frequency of all elements of an array :
25 occurs 1 times
12 occurs 1 times
43 occurs 1 times

9. Write a program in C to find the maximum and minimum elements in an array.
Test Data :
Input the number of elements to be stored in the array :3
Input 3 elements in the array :
element - 0 : 45
element - 1 : 25
element - 2 : 21
Expected Output :
Maximum element is : 45
Minimum element is : 21

10. Write a program in C to separate odd and even integers into separate arrays.
Test Data :

Input the number of elements to be stored in the array :5
Input 5 elements in the array :
element - 0 : 25
element - 1 : 47
element - 2 : 42
element - 3 : 56
element - 4 : 32
Expected Output :
The Even elements are :
42 56 32
The Odd elements are :
25 47

11. Write a program in C to sort elements of an array in ascending order.
Test Data :
Input the size of array : 5
Input 5 elements in the array :
element - 0 : 2
element - 1 : 7
element - 2 : 4
element - 3 : 5
element - 4 : 9
Expected Output :
Elements of array in sorted ascending order:
2 4 5 7 9

12. Write a program in C to sort the elements of the array in descending order.
Test Data :
Input the size of array : 3
Input 3 elements in the array :
element - 0 : 5
element - 1 : 9
element - 2 : 1
Expected Output :
Elements of the array in sorted descending order:
9 5 1

13. Write a program in C to insert the values in the array (sorted list).
Test Data :
Input number of elements you want to insert (max 100): 5

Input 5 elements in the array in ascending order:
element - 0 : 2
element - 1 : 3
element - 2 : 4
element - 3 : 7
element - 4 : 8
Input the value to be inserted : 5
The existing array list is :
2 3 4 7 8
After Insert the list is :
2 3 4 5 7 8

14. Write a program in C to insert values in the array (unsorted list).
Test Data :
Input the size of array : 4
Input 4 elements in the array in ascending order:
element - 0 : 1
element - 1 : 8
element - 2 : 7
element - 3 : 10
Input the value to be inserted : 5
Input the Position, where the value to be inserted :2
Expected Output :
The current list of the array :
1 8 7 10
After Insert the element the new list is :
1 5 8 7 10

15. Write a program in C to delete an element at a desired position from an array.
Test Data :
Input the size of array : 5
Input 5 elements in the array in ascending order:
element - 0 : 1
element - 1 : 2
element - 2 : 3
element - 3 : 4
element - 4 : 5
Input the position where to delete: 3
Expected Output :
The new list is : 1 2 4 5

16. Write a program in C to find the second largest element in an array.
Test Data :
Input the size of array : 5
Input 5 elements in the array :
element - 0 : 2
element - 1 : 9
element - 2 : 1
element - 3 : 4
element - 4 : 6
Expected Output :
The Second largest element in the array is : 6

17. Write a program in C to find the second smallest element in an array.
Test Data :
Input the size of array : 5
Input 5 elements in the array (value must be <9999) :
element - 0 : 0
element - 1 : 9
element - 2 : 4
element - 3 : 6
element - 4 : 5
Expected Output :
The Second smallest element in the array is : 4

18. Write a program in C for a 2D array of size 3x3 and print the matrix.
Test Data :
Input elements in the matrix :
element - [0],[0] : 1
element - [0],[1] : 2
element - [0],[2] : 3
element - [1],[0] : 4
element - [1],[1] : 5
element - [1],[2] : 6
element - [2],[0] : 7
element - [2],[1] : 8
element - [2],[2] : 9
Expected Output :
The matrix is :

1 2 3
4 5 6
7 8 9

19. Write a program in C for adding two matrices of the same size.
Test Data :
Input the size of the square matrix (less than 5): 2
Input elements in the first matrix :
element - [0],[0] : 1
element - [0],[1] : 2
element - [1],[0] : 3
element - [1],[1] : 4
Input elements in the second matrix :
element - [0],[0] : 5
element - [0],[1] : 6
element - [1],[0] : 7
element - [1],[1] : 8
Expected Output :
The First matrix is :

1 2
3 4
The Second matrix is :

5 6
7 8
The Addition of two matrix is :

6 8
10 12

20. Write a program in C for the subtraction of two matrices.
Test Data :
Input the size of the square matrix (less than 5): 2
Input elements in the first matrix :
element - [0],[0] : 5
element - [0],[1] : 6
element - [1],[0] : 7
element - [1],[1] : 8
Input elements in the second matrix :
element - [0],[0] : 1
element - [0],[1] : 2
element - [1],[0] : 3
element - [1],[1] : 4
Expected Output :

The First matrix is :

5 6
7 8
The Second matrix is :

1 2
3 4
The Subtraction of two matrix is :

4 4
4 4

21. Write a program in C for the multiplication of two square matrices.
Test Data :
Input the rows and columns of first matrix : 2 2
Input the rows and columns of second matrix : 2 2
Input elements in the first matrix :
element - [0],[0] : 1
element - [0],[1] : 2
element - [1],[0] : 3
element - [1],[1] : 4
Input elements in the second matrix :
element - [0],[0] : 5
element - [0],[1] : 6
element - [1],[0] : 7
element - [1],[1] : 8
Expected Output :
The First matrix is :

1 2
3 4
The Second matrix is :

5 6
7 8
The multiplication of two matrix is :

19 22
43 50

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

Test Data :
Input the rows and columns of the matrix : 2 2
Input elements in the first matrix :
element - [0],[0] : 1
element - [0],[1] : 2
element - [1],[0] : 3
element - [1],[1] : 4
Expected Output :
The matrix is :

1 2
3 4

The transpose of a matrix is :
1 3
2 4

23. Write a program in C to find the sum of the right diagonals of a matrix.
Test Data :
Input the size of the square matrix : 2
Input elements in the first matrix :
element - [0],[0] : 1
element - [0],[1] : 2
element - [1],[0] : 3
element - [1],[1] : 4
Expected Output :
The matrix is :
1 2
3 4
Addition of the right Diagonal elements is :5
Elements in array are:

24. Write a program in C to find the sum of the left diagonals of a matrix.
Test Data :
Input the size of the square matrix : 2
Input elements in the first matrix :
element - [0],[0] : 1
element - [0],[1] : 2
element - [1],[0] : 3
element - [1],[1] : 4
Expected Output :
The matrix is :

1 2
3 4
Addition of the left Diagonal elements is :5

25. Write a program in C to find the sum of rows and columns of a matrix.
Test Data :
Input the size of the square matrix : 2
Input elements in the first matrix :
element - [0],[0] : 5
element - [0],[1] : 6
element - [1],[0] : 7
element - [1],[1] : 8
Expected Output :
The First matrix is :
The matrix is :
5 6
7 8
The sum or rows and columns of the matrix is :
5 6 11
7 8 15

12 14

26. Write a program in C to print or display the lower triangular of a given matrix.
Test Data :
Input the size of the square matrix : 3
Input elements in the first matrix :
element - [0],[0] : 1
element - [0],[1] : 2
element - [0],[2] : 3
element - [1],[0] : 4
element - [1],[1] : 5
element - [1],[2] : 6
element - [2],[0] : 7
element - [2],[1] : 8
element - [2],[2] : 9
Expected Output :
The matrix is :
1 2 3
4 5 6
7 8 9

Setting zero in lower triangular matrix

1 2 3
0 5 6
0 0 9

27. Write a program in C to print or display an upper triangular matrix.
Test Data :
Input the size of the square matrix : 3
Input elements in the first matrix :
element - [0],[0] : 1
element - [0],[1] : 2
element - [0],[2] : 3
element - [1],[0] : 4
element - [1],[1] : 5
element - [1],[2] : 6
element - [2],[0] : 7
element - [2],[1] : 8
element - [2],[2] : 9
Expected Output :
The matrix is :
1 2 3
4 5 6
7 8 9

Setting zero in upper triangular matrix

1 0 0
4 5 0
7 8 9

28. Write a program in C to calculate the determinant of a 3 x 3 matrix.
Test Data :
Input elements in the first matrix :
element - [0],[0] : 1
element - [0],[1] : 0
element - [0],[2] : -1
element - [1],[0] : 0
element - [1],[1] : 0
element - [1],[2] : 1
element - [2],[0] : -1
element - [2],[1] : -1

element - [2],[2] : 0
Expected Output :
The matrix is :
1 0 -1
0 0 1
-1 -1 0

The Determinant of the matrix is: 1

29. Write a program in C to accept a matrix and determine whether it is a sparse matrix.
Test Data :
Input the number of rows of the matrix : 2
Input the number of columns of the matrix : 2
Input elements in the first matrix :
element - [0],[0] : 0
element - [0],[1] : 0
element - [1],[0] : 1
element - [1],[1] : 0
Expected Output :
The given matrix is sparse matrix.
There are 3 number of zeros in the matrix

30. Write a program in C to accept two matrices and check whether they are equal.
Test Data :
Input Rows and Columns of the 1st matrix :2 2
Input Rows and Columns of the 2nd matrix :2 2
Input elements in the first matrix :
element - [0],[0] : 1
element - [0],[1] : 2
element - [1],[0] : 3
element - [1],[1] : 4
Input elements in the second matrix :
element - [0],[0] : 1
element - [0],[1] : 2
element - [1],[0] : 3
element - [1],[1] : 4
Expected Output :
The first matrix is :
1 2
3 4
The second matrix is :
1 2

3 4
The Matrices can be compared :
Two matrices are equal.

31. Write a program in C to check whether a given matrix is an identity matrix.
Test Data :
Input number of Rows for the matrix :3
Input number of Columns for the matrix :3
Input elements in the first matrix :
element - [0],[0] : 1
element - [0],[1] : 0
element - [0],[2] : 0
element - [1],[0] : 0
element - [1],[1] : 1
element - [1],[2] : 0
element - [2],[0] : 0
element - [2],[1] : 0
element - [2],[2] : 1
Expected Output :
The matrix is :
1 0 0
0 1 0
0 0 1
The matrix is an identity matrix.

32. Write a program in C to find a pair with given sum in the array.
Expected Output :
The given array : 6 8 4 -5 7 9
The given sum : 15
Pair of elements can make the given sum by the value of index 0 and 5

33. Write a program in C to find the majority element of an 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).
Expected Output :
The given array is : 4 8 4 6 7 4 4 8
There are no Majority Elements in the given array.

34. Write a program in C to find the number occurring odd number of times in an array.
All numbers occur even number of times except one number which occurs odd number of times.

Expected Output :
The given array is : 8 3 8 5 4 3 4 3 5
The element odd number of times is : 3

35. Write a program in C to find the largest sum of contiguous subarrays in an array.
Expected Output :
The given array is : 8 3 8 -5 4 3 -4 3 5
The largest sum of contiguous subarray is : 21

36. Write a program in C to find the missing number in a given array. There are no duplicates in the list.
Expected Output :
The given array is : 1 3 4 2 5 6 9 8
The missing number is : 7

37. Write a program in C to find the pivot element of a sorted and rotated array using binary search.
Pivot element is the only element in input array which is smaller than it's previous element.
A pivot element divided a sorted rotated array into two monotonically increasing array.
Expected Output :
The given array is : 14 23 7 9 3 6 18 22 16 36
The Pivot Element in the array is : 3

38. Write a program in C to merge one sorted array into another sorted array.
Pivot element is the only element in input array which is smaller than it's previous element.
A pivot element divided a sorted rotated array into two monotonically increasing array.
Expected Output :
The given Large Array is : 10 12 14 16 18 20 22
The given Small Array is : 11 13 15 17 19 21
After merged the new Array is :
10 11 12 13 14 15 16 17 18 19 20 21 22

39. Write a program in C to rotate an array by N positions.
Expected Output :
The given array is : 0 3 6 9 12 14 18 20 22 25 27
From 4th position the values of the array are : 12 14 18 20 22 25 27
Before 4th position the values of the array are : 0 3 6 9
After rotating from 4th position the array is:
12 14 18 20 22 25 27 0 3 6 9

40. Write a program in C to find the ceiling in a sorted array.
N.B.: 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.
Expected Output :
The given array is : 1 3 4 7 8 9 9 10
The ceiling of 5 is: 7

41. Write a program in C to find the Floor and Ceiling of the number 0 to 10 from a sroted array.
Expected Output :
The given array is : 1 3 5 7 8 9
Number: 0 ceiling is: 1 floor is: -1
Number: 1 ceiling is: 1 floor is: 1
Number: 2 ceiling is: 3 floor is: 1
Number: 3 ceiling is: 3 floor is: 3
Number: 4 ceiling is: 5 floor is: 3
Number: 5 ceiling is: 5 floor is: 5
Number: 6 ceiling is: 7 floor is: 5
Number: 7 ceiling is: 7 floor is: 7
Number: 8 ceiling is: 8 floor is: 8
Number: 9 ceiling is: 9 floor is: 9
Number: 10 ceiling is: -1 floor is: 9

42. Write a program in C to find the smallest missing element in a sorted array.
Expected Output :
The given array is : 0 1 3 4 5 6 7 9
The missing smallest element is: 2

43. Write a program in C to print the next greatest elements in a given unsorted array. Elements for which no superior element exists, consider the next greatest element as -1.
Expected Output :
The given array is : 5 3 10 9 6 13
Next Bigger Elements are:
Next bigger element of 5 in the array is: 10
Next bigger element of 3 in the array is: 10
Next bigger element of 10 in the array is: 13
Next bigger element of 9 in the array is: 13
Next bigger element of 6 in the array is: 13
Next bigger element of 13 in the array is: -1

Next Bigger Elements Array:
10 10 13 13 13 -1

44. Write a program in C to find the two repeating elements in a given array.
Expected Output :
The given array is : 2 7 4 7 8 3 4
The repeating elements are: 7 4

45. Write a program in C to find two elements whose sum is closest to zero.
Expected Output :
The given array is : 38 44 63 -51 -35 19 84 -69 4 -46
The Pair of elements whose sum is minimum are:
[44, -46]

46. Write a program in C to find the smallest positive number missing from an unsorted array.
Expected Output :
The given array is : 3 1 4 10 -5 15 2 -10 -20
The smallest positive number missed is: 5

47. Write a program in C to find a subarray with a given sum from the given array.
Expected Output :
The given array is : 3 4 -7 1 3 3 1 -4
[0..1] -- { 3 4 }
[0..5] -- { 3 4 -7 1 3 3 }
[3..5] -- { 1 3 3 }
[4..6] -- { 3 3 1 }

48. Write a program in C to find out if a given integer x appears more than n/2 times in a sorted array of n integers.
Expected Output :
The given array is : 1 3 3 5 4 3 2 3 3
The given value is : 3
3 appears more than 4 times in the given array[]

49. Write a program in C to find the majority element of an array.
Expected Output :
The given array is : 1 3 3 7 4 3 2 3 3
The majority of the Element : 3

50. Write a program in C to print a matrix in spiral form.
Expected Output :
The given array in matrix form is :
1 2 3 4 5
6 7 8 9 10
11 12 13 14 15
16 17 18 19 20
The spiral form of above matrix is:
1 2 3 4 5 10 15 20 19 18 17 16 11 6 7 8 9 14 13 12

51. Write a program in C to find the maximum circular subarray sum of a given array.
Expected Output :
The given array is : 10 8 -20 5 -3 -5 10 -13 11
The maximum circular sum in the above array is: 29

52. Write a program in C to count the number of triangles that can be formed from a given array.
Expected Output :
The given array is : 6 18 9 7 10
Number of possible triangles can be formed from the array is: 5

53. Write a program in C to find the number of times a given number appears in an array.
Expected Output :
The given array is : 2 3 4 4 4 4 5 5 5 6 7 7
The number of times the number 4 occurs in the given array is: 4