PRACTICE QUESTIONS – ARRAY (1D & 2D)

Q1: 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

Q2: 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

Q3: 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

Q4: 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

Q5: 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

Q6: 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

Q7: 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

Q8: 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

Q9: 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

Q10: 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

Q11: Write a program in C to insert the values in the array (sorted list).
Test Data :
Insert New value in the sorted array :

Input the size of array : 5
Input 5 elements in the array in ascending order:
element - 0 : 2
element - 1 : 5
element - 2 : 7
element - 3 : 9
element - 4 : 11
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

Q12: 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

Q13: 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

Q14: 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

Q15: 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

Q16: 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

Q17: 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

Q18: 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

Q19: 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

Q20: 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

Q21: 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.

Q22: 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.

Q23: 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

Q24: 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.

Q25: 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

Q26: 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

Q27: 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

Q28: 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

Q29: Write a program in C to check whether an array is a subset of another array.
Expected Output :
The given first array is : 4 8 7 11 6 9 5 0 2

The given second array is : 5 4 2 0 6
The second array is the subset of first array.

Q30: Write a program in C to find the sum of the upper triangular elements of a matrix.
Expected Output:
The given array is :
1 2 3
4 5 6
7 8 9
The elements being summed of the upper triangular matrix are: 2 3 6
The Sum of the upper triangular Matrix Elements are: 11

Q31: Sorting Variations for 2D matrices

- ⇨ Descending column wise
- ⇨ Descending row wise
- ⇨ Ascending column wise
- ⇨ Ascending row wise

Q32: Dot Matrix Variations for 2D matrices

- ⇨ If row & column even – Add If odd – subtract
- ⇨ 1st row with 1st column
- ⇨ 1st column with 1st row
- ⇨ 1st row with last column
- ⇨ Last column with first row
- ⇨ Last row last column
- ⇨ Last row 1st column
- ⇨ Last row last column

Q33: Transpose Variations for 2D matrices

- ⇨ Rows into columns – simple transpose
- ⇨ Last row to first column
- ⇨ Last column to first row
- ⇨ Last row to first row
- ⇨ Last column to first column
- ⇨ Simple transpose and invert the matrix