1 D Array Exercises

1. Write a program to input elements in array and print all negative elements.
Sample Input:

-1

-10

100

5

61

-2

-23

8

-90

51

Sample Output:

-1, -10, -2, -23, -90

2. Write a program to read elements in an array and find the sum of array elements.

Sample Input:

Input elements: 10, 20, 30, 40, 50

Sample Output:

Sum of all elements = 150

3. Write a program to input elements in an array from user, find maximum and minimum element in array.

Sample Input:

Input array elements: 10, 50, 12, 16, 2

Sample Output:

Maximum = 50

Minimum = 2

4. Write a program to find second largest element in an array.

Sample Input:

Input array elements: -7 2 3 8 6 6 75 38 3 2

Sample Output:

Second largest = 38

5. Write a program to input elements in array from user and count even and odd elements in array.

Sample Input:

Input array: 1 2 3 4 5 6 7 8 9

Sample Output:

Total even elements: 4

Total odd elements: 5

6. Write a program to input elements in array and count negative elements in array.

Sample Input:

Input array elements: 10, -2, 5, -20, 1, 50, 60, -50, -12, -9

Sample Output:

Total number of negative elements: 5

7. Write a C program to input elements in array and copy all elements of first array into second array.

Sample Input:

Input array1 elements: 10 1 95 30 45 12 60 89 40 -4

Sample Output:

Array1: 10 1 95 30 45 12 60 89 40 -4

Array2: 10 1 95 30 45 12 60 89 40 -4

8. Write a program to insert element in array at specified position.

Sample Input:

Input array elements: 10, 20, 30, 40, 50

Input element to insert: 25

Input position where to insert: 3

Sample Output:

Elements of array are: 10, 20, 25, 30, 40, 50

9. Write a program to delete element from array at specified position.

Sample Input:

Input array elements: 10 20 30 40 50

Input position to delete: 2

Sample Output:

Array elements: 10, 30, 40, 50

10. Write a program to input elements in array and find frequency of each element in array.

Sample Input:

Input array elements: 5, 10, 2, 5, 50, 5, 10, 1, 2, 2

Sample Output:

Frequency of 5 = 3

Frequency of 10 = 2

Frequency of 2 = 3

Frequency of 50 = 1

Frequency of 1 = 1

11. Write a program to input elements in array and print all unique elements in array.

Sample Input:

Input array elements: 1, 2, 3, 5, 1, 5, 20, 2, 12, 10

Sample Output:

All unique elements in the array are: 3, 20, 12, 10

12. Write a program to input elements in array from user and count duplicate elements in array.

Sample Input:

Input array elements: 1, 10, 20, 1, 25, 1, 10, 30, 25, 1

Sample Output:

Total number of duplicate elements = 5

13. Write a program to delete duplicate elements from array. How to remove duplicate elements from array in C programming.

Sample Input:

Input array elements: 10, 20, 10, 1, 100, 10, 2, 1, 5, 10

Sample Output:

After removing all duplicate elements

Elements of array are: 10, 20, 1, 100, 2, 5

14. Write a program to input elements in two array and merge two array to third array.

Input

Input first array elements: 1, 4, 6, 9, 15

Input second array elements: 2, 5, 8, 10

Output

Merged array in ascending order = 1, 2, 4, 5, 6, 8, 9, 10, 15

15. Write a program to input elements in array and find reverse of array.

Sample Input:

Input array elements: 10, 5, 16, 35, 500

Sample Output:

Array elements after reverse: 500, 35, 16, 5, 10

16. Write a program to input elements in array and put even and odd elements in separate array.

Sample Input:

Input size of the array: 10

Input elements in array: 0 1 2 3 4 5 6 7 8 9

Sample Output:

Output even elements in array: 0 2 4 6 8

Output odd elements in array: 1 3 5 7 9

17. Write a program to input elements in array and search whether an element exists in array or not.

Sample Input:

Input size of array: 10

Input elements in array: 10, 12, 20, 25, 13, 10, 9, 40, 60, 5

Sample Output:

Element to search is: 25

Element found at index 3

18. Write a program to input elements in array and sort array elements in ascending or descending order.

Sample Input:

Input size of array: 10

Input array elements: 20, 2, 10, 6, 52, 31, 0, 45, 79, 40

Sample Output:

Array sorted in ascending order: 0, 2, 6, 10, 20, 31, 40, 45, 52, 79

19. Write a program to input elements in an array from user and sort all even and odd elements of the given array separately without using any other array.

Sample Input:

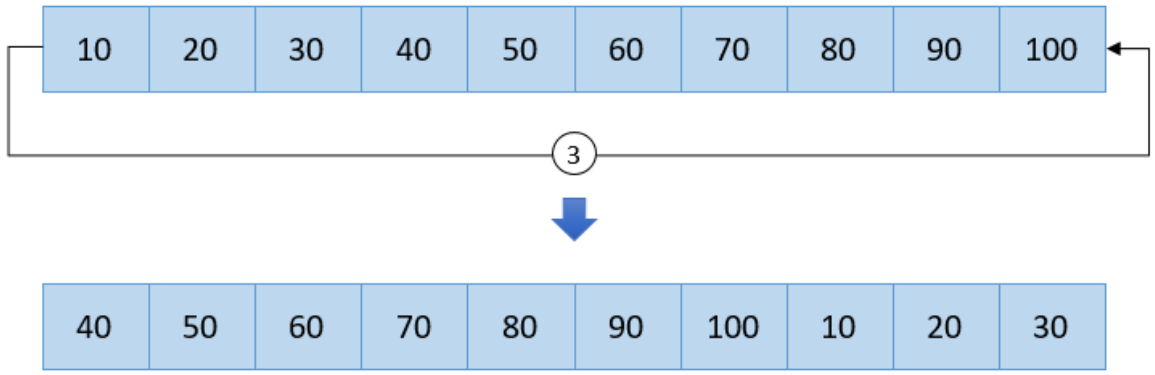
Input size of array: 10

Input elements of array: 0 5 1 2 3 4 6 12 10 9

Sample Output:

Output in sorted order: 0 2 4 6 10 12 1 3 5 9

20. Write a program to left rotate an array by n position.



Sample Input:

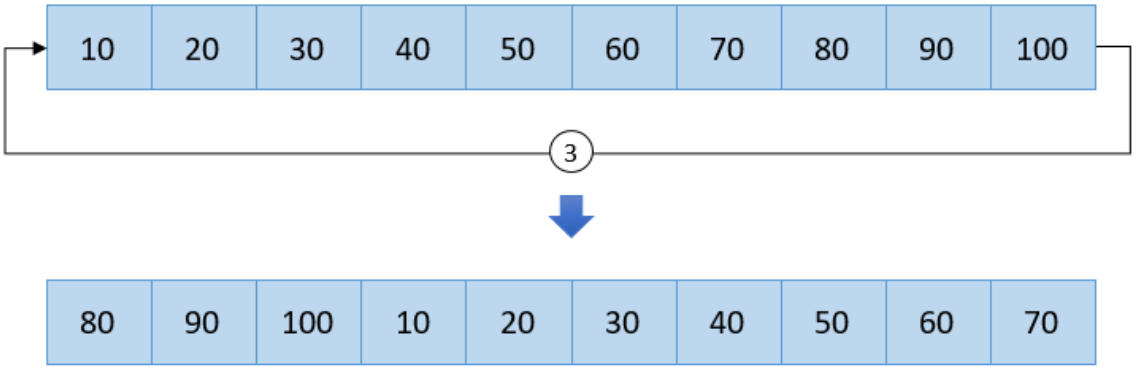
Input 10 elements in array: 1 2 3 4 5 6 7 8 9 10

Input number of times to rotate: 3

Sample Output:

Array after left rotation 3 times: 4 5 6 7 8 9 10 1 2 3

21. Write a C program to right rotate an array by n position.



Sample Input:

Input 10 elements in array: 1 2 3 4 5 6 7 8 9 10

Input number of times to rotate: 3

Sample Output:

Array after right rotation: 8 9 10 1 2 3 4 5 6 7

2D Array Exercises

1. Write a program to read elements in two matrices and add elements of both matrices.

Sample Input:

Input elements in 3x3 matrix1:

1 2 3

4 5 6

7 8 9

Input elements in 3x3 matrix2:

9 8 7

6 5 4

3 2 1

Sample Output:

Sum of both matrix =

10 10 10

10 10 10

10 10 10

2. Write a program to read elements in two matrices and find the difference of two matrices.

Sample Input:

Input elements in 3x3 matrix1:

1 2 3

4 5 6

7 8 9

Input elements in 3x3 matrix2:

9 8 7

6 5 4

3 2 1

Sample Output:

Difference of both matrices =

-8 -6 -4

-2 0 2

4 6 8

3. Write a program to read elements in a matrix and perform scalar multiplication of matrix.

Sample Input

Input elements of matrix A:

1 2 3

4 5 6

7 8 9

Input multiplier: 2

Sample Output:

2 4 6

8 10 12

14 16 18

Scalar multiplication of matrix

Scalar multiplication of matrix is the simplest and easiest way to multiply matrix. Scalar multiplication of matrix is defined by – $(cA)_{ij} = c \cdot A_{ij}$ (Where $1 \leq i \leq m$ and $1 \leq j \leq n$)

$$2 \cdot \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix} = \begin{bmatrix} 2.1 & 2.2 & 2.3 \\ 2.4 & 2.5 & 2.6 \\ 2.7 & 2.8 & 2.9 \end{bmatrix}$$

$$= \begin{bmatrix} 2 & 4 & 6 \\ 8 & 10 & 12 \\ 14 & 16 & 18 \end{bmatrix}$$

4. Write a program to read elements in two matrices and multiply them.

Sample Input:

Input elements of matrix1:

1 2 3

4 5 6

7 8 9

Input elements of matrix2:

9 8 7

6 5 4

3 2 1

Sample Output:

Product of matrices =

30 24 18

84 69 54

138 114 90

5. Write a C program to enter elements in two matrices and check whether both matrices are equal or not.

Sample Input:

Input elements of matrix1:

1 2 3

4 5 6

7 8 9

Input elements of matrix2:

1 2 3

4 5 6

7 8 9

Sample Output:

Both matrices are equal

6. Write a C program to read elements in a matrix and find the sum of main diagonal (major diagonal) elements of matrix.

Sample Input:

Input array elements:

1 2 3

4 5 6

7 8 9

Sample Output:

Sum of main diagonal elements = 15

7. Write a C program to read elements in a matrix and find the sum of minor diagonal (opposite diagonal) elements.

Sample Input:

Input elements in array:

1 2 3

4 5 6

7 8 9

Sample Output:

Sum of minor diagonal elements = 15

8. Write a C program to read elements in a matrix and find the sum of elements of each row and columns of matrix.

Sample Input:

Input elements in array:

1 2 3

4 5 6

7 8 9

Sample Output:

Sum of row 1 = 6

Sum of row 2 = 15

...

...

Sum of column 3 = 18

9. Write a program to read elements in a matrix and interchange elements of primary(major) diagonal with secondary(minor) diagonal.

Sample Input:

Input matrix elements:

1 2 3

4 5 6

7 8 9

Sample Output:

Matrix after interchanging its diagonal:

3 2 1

4 5 6

9 8 7

10. Write a C program to read elements in a matrix and check whether the matrix is upper triangular matrix or not.

Sample Input:

Input elements of matrix:

1 2 3

0 5 6

0 0 9

Sample Output:

Matrix is upper triangular

11. Write a C program to read elements in a matrix and check whether the matrix is a lower triangular matrix or not.

Sample Input:

Input elements in matrix:

1 0 0

4 5 0

7 8 9

Sample Output:

Matrix is lower triangular

12. Write a C program to read elements in a matrix and find sum of upper triangular matrix.

Sample Input:

Input matrix elements:

1 2 3

0 5 6

0 0 9

Sample Output:

Sum of upper triangular matrix = 11

13. Write a C program to read elements in a matrix and find sum of lower triangular matrix.

Sample Input:

Input elements in matrix:

1 0 0

4 5 0

7 8 9

Sample Output:

Sum of lower triangular matrix = 19

14. Write a C program to read elements in a matrix and find transpose of the given matrix.

Sample Input:

Input elements in matrix:

1 2 3

4 5 6

7 8 9

Sample Output:

Transpose:

1 4 7

2 5 8

3 6 9

15. Write a C program to read elements in a matrix and find determinant of the given matrix.

Sample Input:

Input elements in 2x2 matrix:

1 2

3 4

Sample Output:

Determinant of the matrix = -2

16. Write a C program to read elements in a matrix and check whether matrix is an Identity matrix or not.

Sample Input:

Input elements in matrix:

1 0 0

0 1 0

0 0 1

Sample Output:

It is an Identity matrix

17. Write a C program to read elements in a matrix and check whether matrix is Sparse matrix or not.

Sample Input:

Input elements in matrix:

1 0 3

0 0 4

6 0 0

Sample Output:

The given matrix is Sparse matrix

18. Write a C program to read elements in a matrix and check whether the given matrix is symmetric matrix or not.

Sample Input:

Input matrix elements:

1 2 3

2 4 5

3 5 8

Sample Output:

Given matrix is symmetric matrix.