INDIAN SCHOOL DARSAIT
DEPARTMENT OF ICT

Subject: Computer Science   **Topic:** Arrays(1D & 2D)   **Worksheet No. :** 12

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1. Write a function in C++ which accepts an integer array and its size as arguments and replaces elements having even values with its half and elements having odd values with twice its value.

2. Write a function in C++ which accepts an integer array and its size as argument and exchanges the value of first half side elements with the second half side elements of the array.
   Example: If an array of eight elements has initial content as 2,4,1,6,7,9,23,10.
   The function should rearrange the array as 7,9,23,10,2,4,1,6.

3. Write a function in C++, which accepts an integer array and its size as parameters and rearrange the array in reverse. Example if an array of five members initially contains the elements as 6,7,8,13,9,19 Then the function should rearrange the array as 19,9,13,8,7,6

4. Write a function in C++, which accept an integer array and its size as arguments and swap the elements of every even location with its following odd location. Example : if an array of nine elements initially contains the elements as 2,4,1,6,5,7,9,23,10 Then the function should rearrange the array as 4,2,6,1,7,5,23,9,10

5. Write a function in C++ which accepts an integer array and its size as arguments and replaces elements having odd values with thrice and elements having even values with twice its value. Example: If an array of five elements initially contains the elements 3,4,5,16,9 Then the function should rearrange the content of the array as 9,8,15,32,27

6. Write a function in C++ which accepts an integer array and its size as arguments/parameters and exchanges the values at alternate locations.
   example : if the array is 8,10,1,3,17,90,13,60 then rearrange the array as 10,8,3,1,90,17,60,13

7. Write a Get1From2 ( ) function in C++ to transfer the content from two arrays FIRST[ ] and SECOND[ ] to array ALL[ ]. The even places (0, 2, 4,...) of array ALL[ ] should get the content from the array FIRST[ ] and odd places (1, 3, 5,) of the array ALL[] should get the content from the array SECOND[ ].
   Example:
   If the FIRST[ ] array contains   30, 60, 90
   And the SECOND[ ] array contains   10, 50, 80
   The ALL[ ] array should contain   30, 10, 60, 50, 90, 80

8. Write a Get2From1() function in C++ to transfer the content from one array ALL[] to two different arrays Odd[] and Even[]. The Odd[] array should contain the values from odd positions (1,3,5,...) of ALL[] and Even [] array should contain the values from even positions (0, 2, 4,…..) of ALL [].

Example
If the ALL[] array contains
12, 34, 56, 67, 89, 90
The Odd[] array should contain
34, 67, 90
And the Even [] array should contain
12,56,89

9. Write a function in C++ to merge the contents of two sorted arrays A & B into third array C. Assuming array A is sorted in ascending order, B is sorted in descending order, the resultant array is required to be in ascending order.

10. Given two arrays of integers x and y of sizes m and n respectively. Third array of integers z has m+n size. These are passed as the arguments to the function EXCHANGE(). Write a function named EXCHANGE() which will produce the elements to the third array named z, such that the following sequence is followed:
    (i)   All odds numbers of x from left to right are copied into z from left to right.
    (ii) All even number of x from left to right are copied into z from right to left.
    (iii) All odd numbers of y from left to right are copied into z from left to right.
    (iv) All even number of y from left to right are copied into z from right to left.
     e.g.:   x is {3,2,1,7,6,3}
    and   y is {9,3,5,6,2,8,10}
    then   z = {3,1,7,3,9,3,5,10,8,2,6,6,2}

11. Write function SORTPOINTS() in c++ to sort an array of structure Game in descending order of points using Bubble Sort
    Note: Assume the following definition of structure Game
    struct Game
    {
      long PNo;   // Player Number
      char PName[20];
      long points;
    };

12. Write a function in C++ to find sum of rows from a two dimensional array.

13. Write a function in C++ to find the sum of both left and right diagonal elements from a two dimensional array (matrix).

14. Write a function to fins the sum of all upper triangle and lower triangle elements of a matrix.

15. Write a function to fins the sum of all even location elements of a 2D matrix.

16. Write a function in C++ which accepts an integer array and its size as arguments and assign the elements into a two dimensional array of integers in the following format

If the array is 1,2,3,4,5,6	if the array is 1,2,3
The resultant 2D array is	The resultant 2D array is
1 2 3 4 5 6	1 2 3
0 1 2 3 4 5	0 1 2
0 0 1 2 3 4	0 0 1
0 0 0 1 2 3	
0 0 0 0 1 2	
0 0 0 0 0 1	

15. Write a function in C++ which accepts an integer array of double dimensional with its size as arguments and displays the total numbers of odd, even and prime numbers in the array. Example : if the following integer array will be passed to the function, i.e.

6	4	13	19	5
7	3	8	11	51
9	12	23	4	6
21	29	18	9	10
28	5	12	2	6

Then the output should be :   The total odd numbers are : 13
                                The total odd numbers are : 12
                                The total odd numbers are : 10

17. Write a function in C++ to find and display the sum of each row and each column of 2 dimensional array. Use the array and its size as parameters with int as the data type of the array.

18. Write a function in C++ to print the product of each row of a two dimensional array passed as the arguments of the function

19. Write a user defined function in C++ which accepts a squared integer matrix with odd dimensions (3*3, 5*5..) & display the sum of the middle row & middle column elements. For ex. :

                    2 5 7
                    3 7 2
                    5 6 9

    The output should e :
    Sum of middle row = 12
    Sum of middle column = 18

20. Write a function in C++ which accepts a 2D array of integers and its size as arguments and displays elements which are exactly two digit number.

21. Define a function SWAPARR( ) in c++ to swap the first row elements with the last row elements, for a 2d integer array passed as the argument of the function.

If the 2D array contains	After swapping of the contents of first and last row
5 6 3 2	9 7 5 8
1 2 4 9	1 2 4 9
2 5 8 1	2 5 8 1
9 7 5 8	5 6 3 2

22. An array x[30][10] is stored in the memory with each element requiring 4 bytes of storage. If the base address of x is 4500, find out memory locations of x[12][8] and x[2][4], if the content is stored along the row.

23. An array P[20][30] is stored in the memory along the column with each of the element occupying 4 bytes, find out the Base Address of the array, if an element P[2][20] is stored at the memory location 5000.

24. An array ARR[5][25] is stored in the memory with each element occupying 4 bytes of space. Assuming the base address of ARR to be 1000, compute the address of ARR[5][7], when the array is stored as : (i) Row wise   (ii) Column wise.

25. An array S[40][30] is stored in the memory along the row with each of the element occupying 2 bytes, find out the memory location for the element S[20][10], if an element S[15][5] is stored at the memory location 5500.

26. An array P[20][30] is stored in the memory along the column with each of the element occupying 4 bytes, find out the memory location for the element P[5][15], if an element P[2][20] is stored at the memory location 5000.