

## Print a given matrix in spiral form

Given a 2D array, print it in spiral form. See the following examples.

Input :

```
1  2  3  4
5  6  7  8
9 10 11 12
13 14 15 16
```

Output :

```
1 2 3 4 8 12 16 15 14 13 9 5 6 7 11 10
```

Input :

```
1  2  3  4  5  6
7  8  9 10 11 12
13 14 15 16 17 18
```

Output :

```
1 2 3 4 5 6 12 18 17 16 15 14 13 7 8 9 10 11
```

**Solution:**

```
/* This code is adopted from the solution given
   @ http://effprog.blogspot.com/2011/01/spiral-printing-of-two-dimens
```

```
#include <stdio.h>
#define R 3
#define C 6
```

```
void spiralPrint(int m, int n, int a[R][C])
```

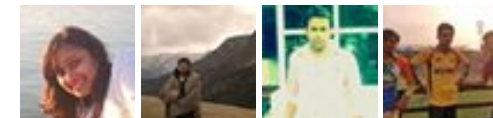
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```
{
    int i, k = 0, l = 0;

    /* k - starting row index
       m - ending row index
       l - starting column index
       n - ending column index
       i - iterator
    */

    while (k < m && l < n)
    {
        /* Print the first row from the remaining rows */
        for (i = l; i < n; ++i)
        {
            printf("%d ", a[k][i]);
        }
        k++;

        /* Print the last column from the remaining columns */
        for (i = k; i < m; ++i)
        {
            printf("%d ", a[i][n-1]);
        }
        n--;

        /* Print the last row from the remaining rows */
        if (k < m)
        {
            for (i = n-1; i >= l; --i)
            {
                printf("%d ", a[m-1][i]);
            }
            m--;
        }

        /* Print the first column from the remaining columns */
        if (l < n)
        {
            for (i = m-1; i >= k; --i)
            {
                printf("%d ", a[i][l]);
            }
            l++;
        }
    }
}
```

```

/* Driver program to test above functions */
int main()
{
    int a[R][C] = { {1, 2, 3, 4, 5, 6},
                    {7, 8, 9, 10, 11, 12},
                    {13, 14, 15, 16, 17, 18}
    };

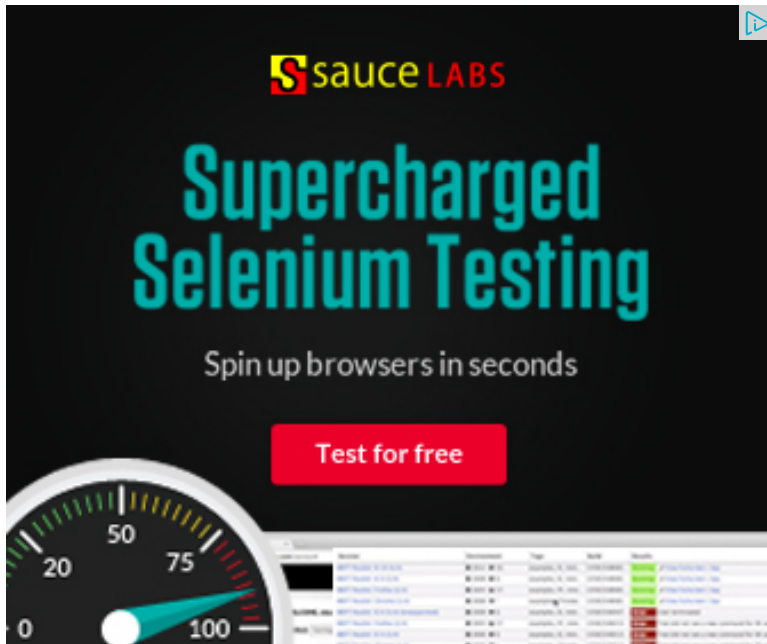
    spiralPrint(R, C, a);
    return 0;
}

/* OUTPUT:
1 2 3 4 5 6 12 18 17 16 15 14 13 7 8 9 10 11
*/

```

Time Complexity: Time complexity of the above solution is  $O(mn)$ .

Please write comments if you find the above code incorrect, or find other ways to solve the same problem.



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|--------|-----------------------|-----------|---------|
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| test2  | Windows 10, Chrome 60 | Unit Test | Failed  |
| test3  | Windows 10, Chrome 60 | Unit Test | Passed  |
| test4  | Windows 10, Chrome 60 | Unit Test | Passed  |
| test5  | Windows 10, Chrome 60 | Unit Test | Passed  |
| test6  | Windows 10, Chrome 60 | Unit Test | Passed  |
| test7  | Windows 10, Chrome 60 | Unit Test | Passed  |
| test8  | Windows 10, Chrome 60 | Unit Test | Passed  |
| test9  | Windows 10, Chrome 60 | Unit Test | Passed  |
| test10 | Windows 10, Chrome 60 | Unit Test | Passed  |

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- Divide and Conquer | Set 6 (Search in a Row-wise and Column-wise Sorted 2D Array)
- Bucket Sort
- Kth smallest element in a row-wise and column-wise sorted 2D array | Set 1
- Find the number of zeroes
- Find if there is a subarray with 0 sum
- Divide and Conquer | Set 5 (Strassen's Matrix Multiplication)
- Count all possible groups of size 2 or 3 that have sum as multiple of 3



30



0



0

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