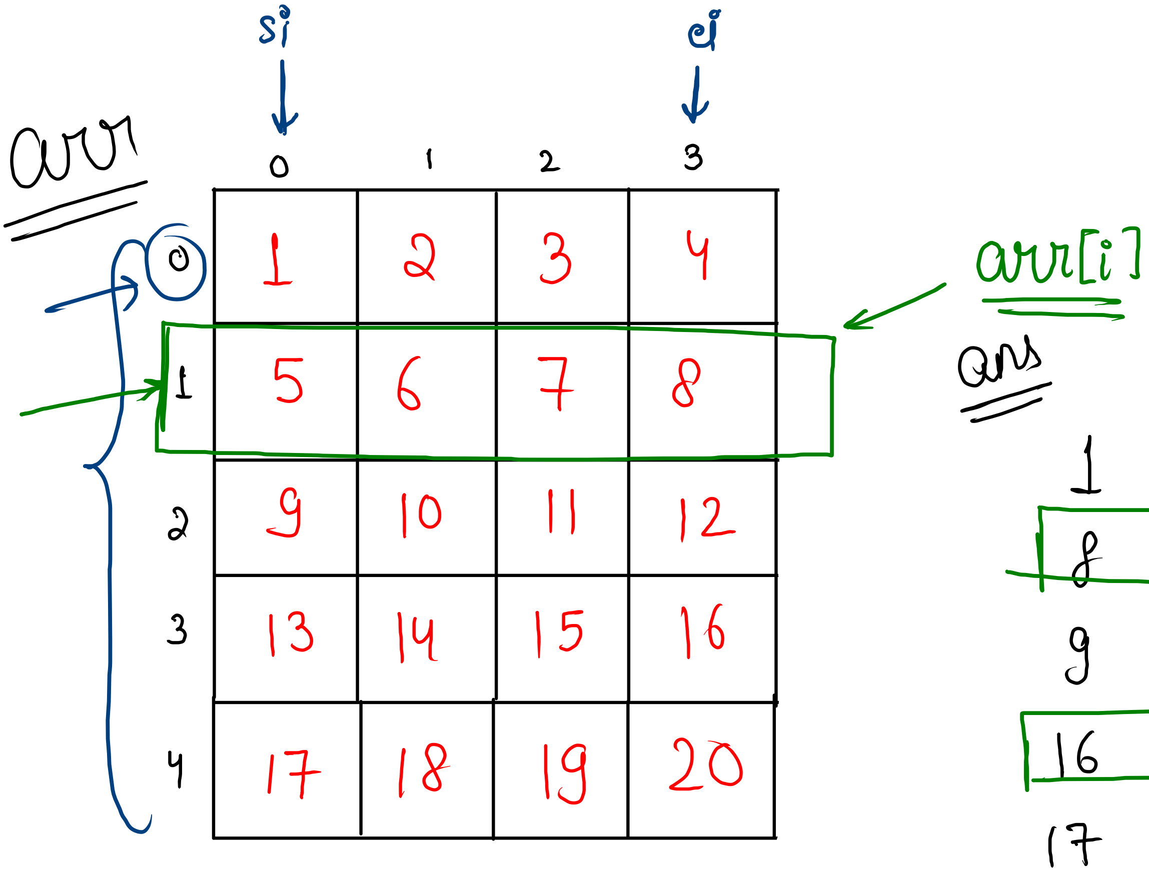
Print row wise with condition



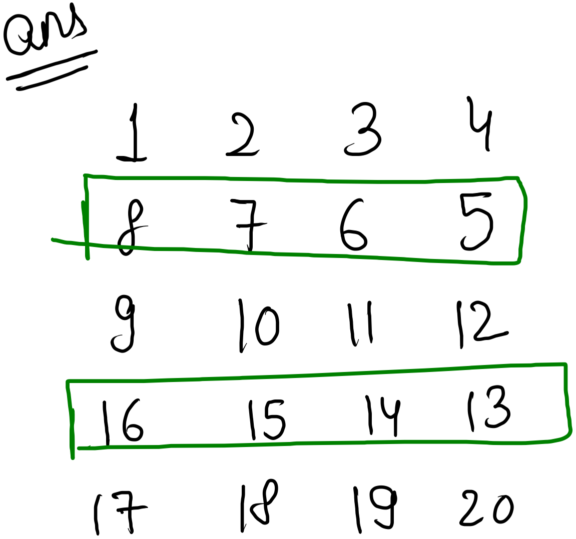
	0	1	2	3
0	1	2	3	4
1	5	6	7	8
2	9	10	11	12
3	13	14	15	16
4	17	18	19	20

observation

rows with even index
print left to right

rows with odd index
print right to left

ans



1 2 3 4
8 7 6 5
9 10 11 12
16 15 14 13
17 18 19 20

whenever printing directly then it is ✓ जुगाड़

Code

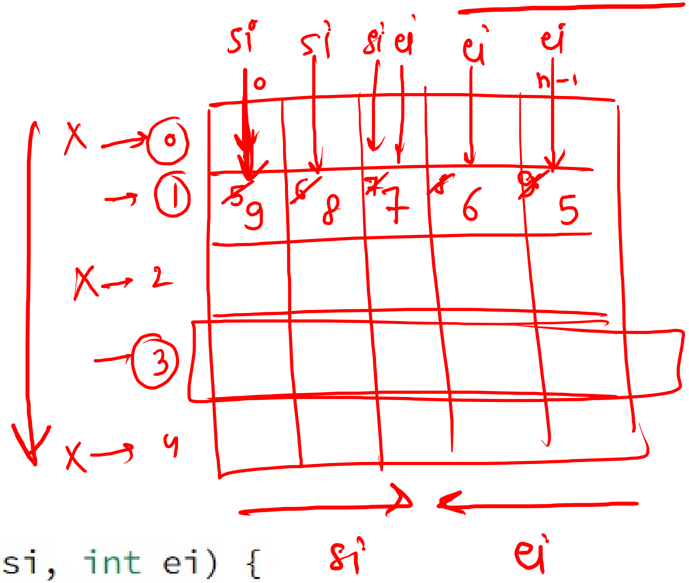
```
m = 5   // rows
 n = 4  // cols

for(int i=0; i<m ; i++){
    if( i % 2 == 0 ){
        for( int j=0; j<n ; j++){
                Syso( arr[i][j]+" ");
        }
    } else {
        for( int j=n-1; j>=0; j--){
                Syso( arr[i][j]+" ");
        }
    }
    Sysoln();
}
```

$T.C = O(m*n)$

Correct code works everywhere

$$T.C = O\left(\frac{m*n}{2}\right) \cong O(m*n)$$

```
public static int[][] printRowwiseWithCondition(int[][] arr, int m, int n) {
    for (int i = 0; i < m; i++) {
        if ( i % 2 != 0 ) {
            int si = 0;
            int ei = n - 1;
            while ( si < ei ) {
                swap(arr[i], si, ei);
                si++;
                ei--;
            }
        }
    }
    return arr;
}
public static void swap(int[] arr, int si, int ei) {
    int temp = arr[si];
    arr[si] = arr[ei];
    arr[ei] = temp;
}
```



Convert 1-D Array to 2-D Array

arr1d =

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

p = 3 // no. of rows

q = 5 // no. of cols

ans

arr2d =

	0	1	2	3	4
0	1	2	3	4	5
1	6	7	8	9	10
2	11	12	13	14	15

index of 1d array	→	index of 2D array
0	→	(0,0)
1	→	(0,1)
2	→	(0,2)
3	→	(0,3)
4	→	(0,4)
5	→	(1,0)
6	→	(1,1)
7	→	(1,2)
8	→	(1,3)
9	→	(1,4)
10	→	(2,0)
11	→	(2,1)
12	→	(2,2)
13	→	(2,3)
14	→	(2,4)

$$\boxed{\begin{aligned} p &= 3 \\ q &= 5 \end{aligned}}$$

index of 1d array = idx

index of 2d array = i & j

V.V. Imp

$$\boxed{\begin{aligned} i &= idx / q ; \\ j &= idx \% q ; \end{aligned}}$$

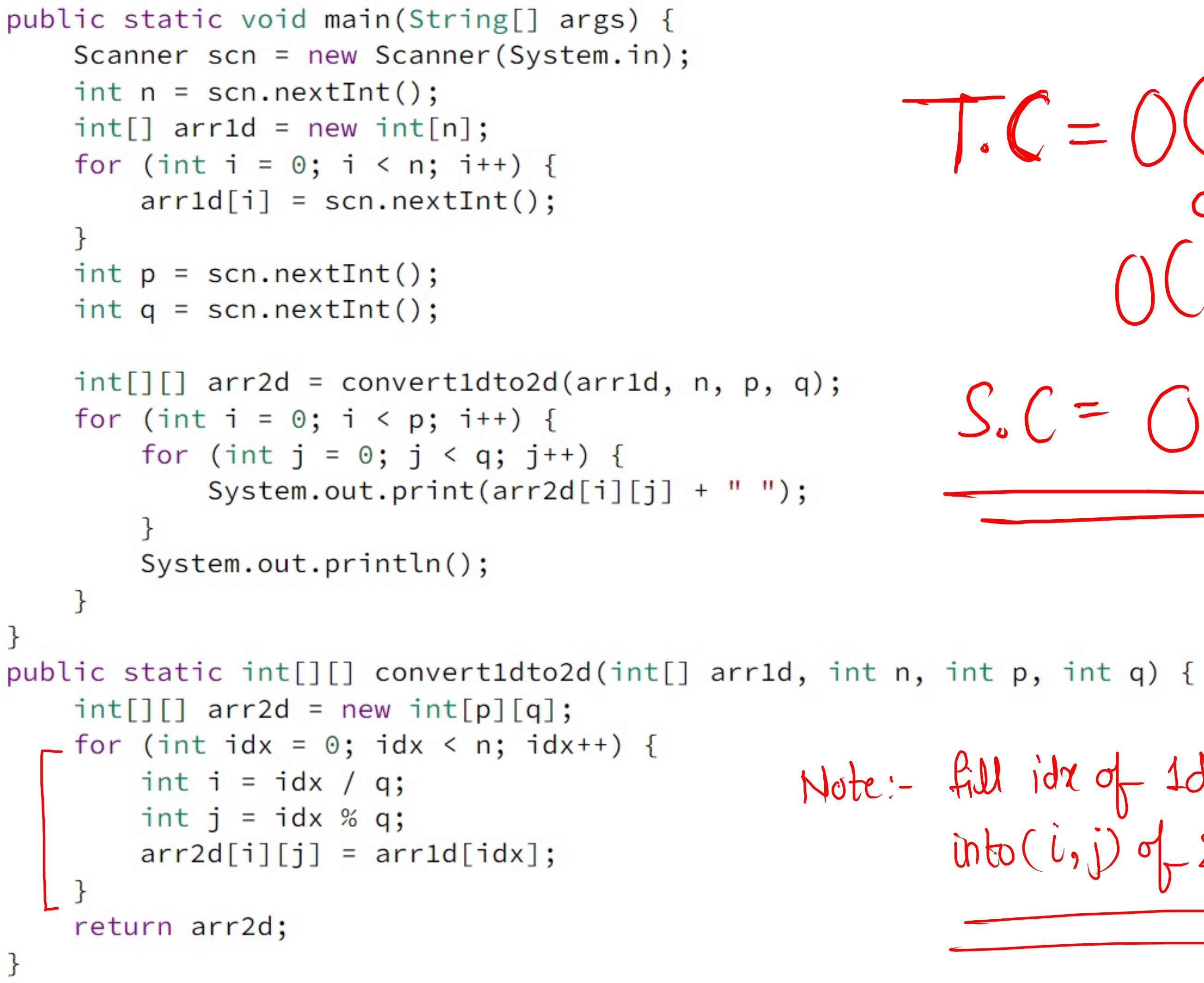
find index of 2d array using 1d

$$idx = i * q + j$$

find index of 1d using 2d

code

1d to 2d



```
public static void main(String[] args) {
    Scanner scn = new Scanner(System.in);
    int n = scn.nextInt();
    int[] arr1d = new int[n];
    for (int i = 0; i < n; i++) {
        arr1d[i] = scn.nextInt();
    }
    int p = scn.nextInt();
    int q = scn.nextInt();

    int[][] arr2d = convert1dto2d(arr1d, n, p, q);
    for (int i = 0; i < p; i++) {
        for (int j = 0; j < q; j++) {
            System.out.print(arr2d[i][j] + " ");
        }
        System.out.println();
    }
}
public static int[][] convert1dto2d(int[] arr1d, int n, int p, int q) {
    int[][] arr2d = new int[p][q];
    for (int idx = 0; idx < n; idx++) {
        int i = idx / q;
        int j = idx % q;
        arr2d[i][j] = arr1d[idx];
    }
    return arr2d;
}
```

T.C = $O(n)$
or
$O(p*q)$

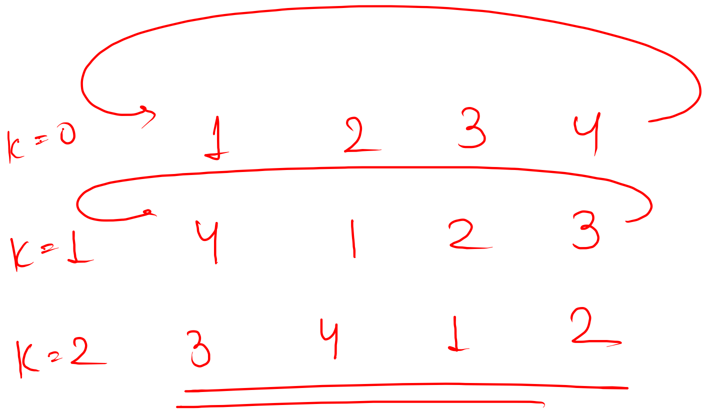
S.C = $O(1)$

Note:- fill idx of 1d array into (i, j) of 2d array

Shift Matrix Row-Wise

$$arr = \begin{array}{c|cccc} & 0 & 1 & 2 & 3 \\ \hline 0 & 1 & 2 & 3 & 4 \\ 1 & 5 & 6 & 7 & 8 \\ 2 & 9 & 10 & 11 & 12 \\ 3 & 13 & 14 & 15 & 16 \end{array} \quad \begin{array}{c} \\ \longrightarrow \\ \longrightarrow \\ \longrightarrow \\ \longrightarrow \end{array} \quad \begin{array}{|c|c|c|c|} \\ \hline 3 & 4 & 1 & 2 \\ \hline 7 & 8 & 5 & 6 \\ \hline 11 & 12 & 9 & 10 \\ \hline 15 & 16 & 13 & 14 \\ \hline \end{array}$$

$\underline{\underline{k = 2}}$

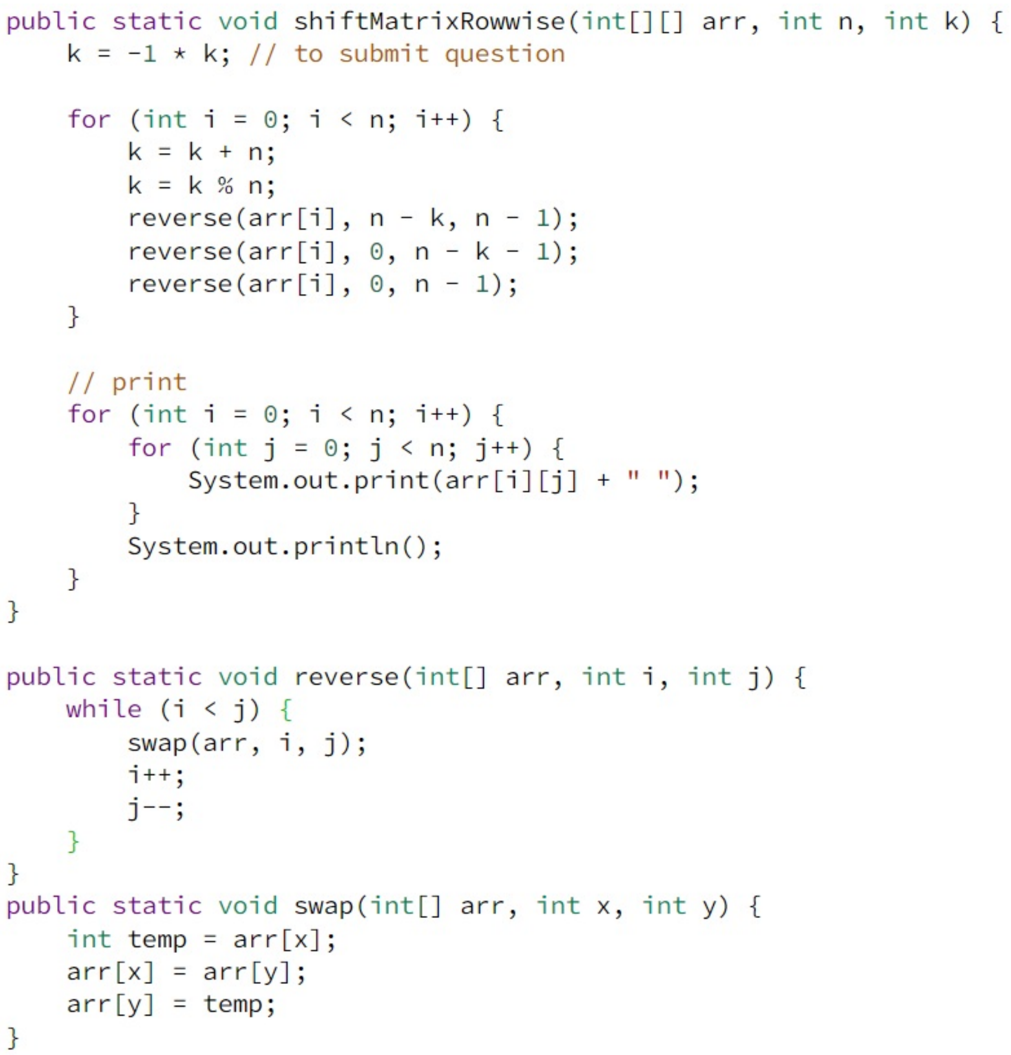


k = 0   1   2   3   4

k = 1   4   1   2   3

k = 2   3   4   1   2

Code



```java
public static void shiftMatrixRowwise(int[][] arr, int n, int k) {
    k = -1 * k; // to submit question

    for (int i = 0; i < n; i++) {
        k = k + n;
        k = k % n;
        reverse(arr[i], n - k, n - 1);
        reverse(arr[i], 0, n - k - 1);
        reverse(arr[i], 0, n - 1);
    }

    // print
    for (int i = 0; i < n; i++) {
        for (int j = 0; j < n; j++) {
            System.out.print(arr[i][j] + " ");
        }
        System.out.println();
    }
}

public static void reverse(int[] arr, int i, int j) {
    while (i < j) {
        swap(arr, i, j);
        i++;
        j--;
    }
}
public static void swap(int[] arr, int x, int y) {
    int temp = arr[x];
    arr[x] = arr[y];
    arr[y] = temp;
}
```