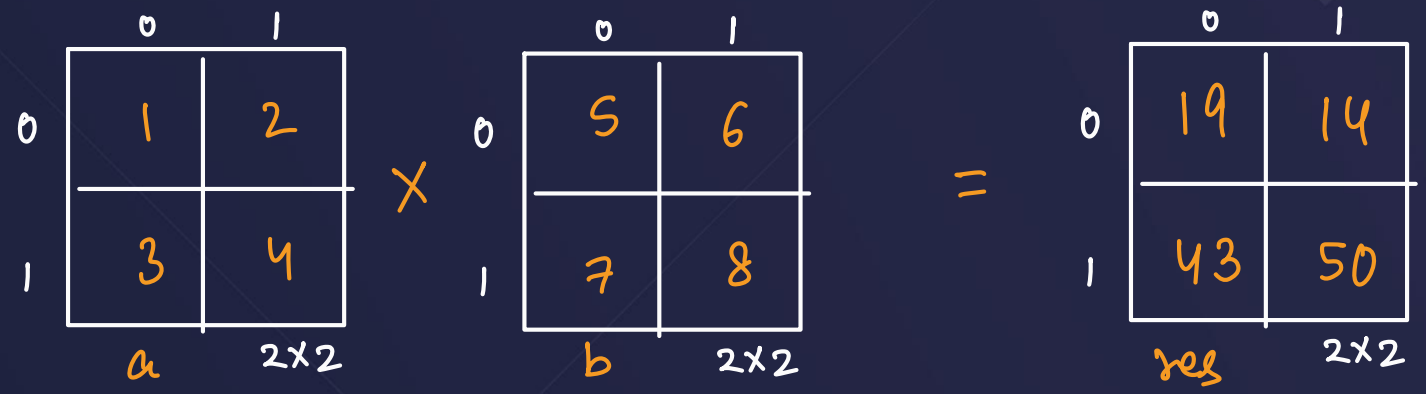
2D Arrays-2

Lecture- 15

Raghav Garg

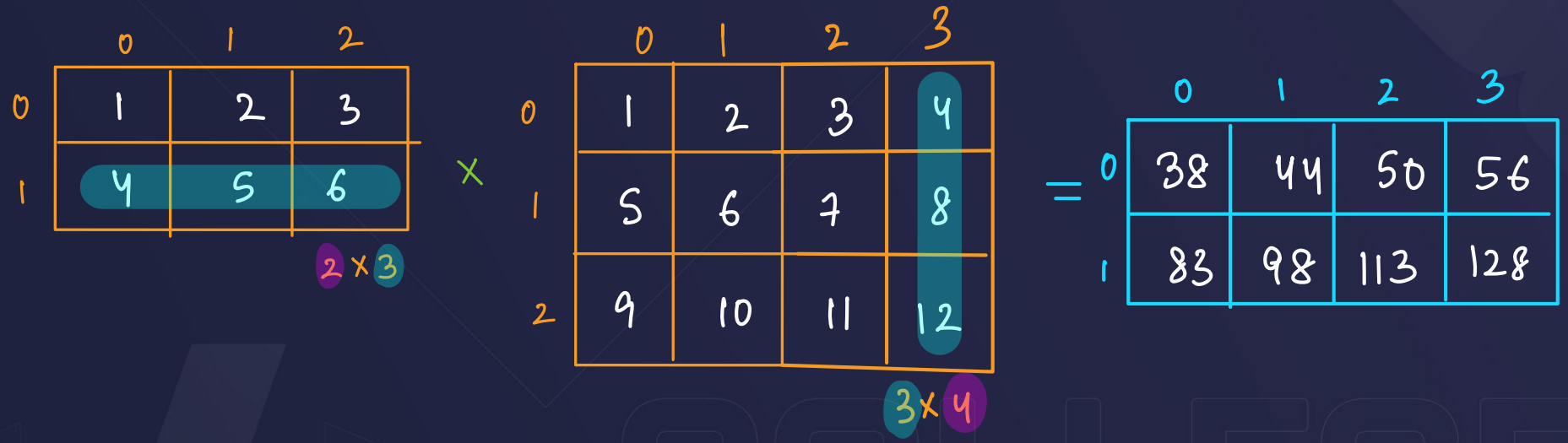
Ques : Write a program to print the multiplication of two matrices given by the user.

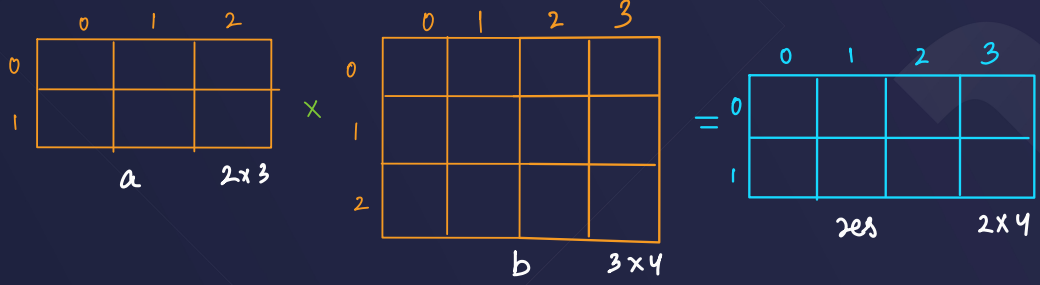


row
2D array

column
2D array

Ques : Write a program to print the multiplication of two matrices given by the user.



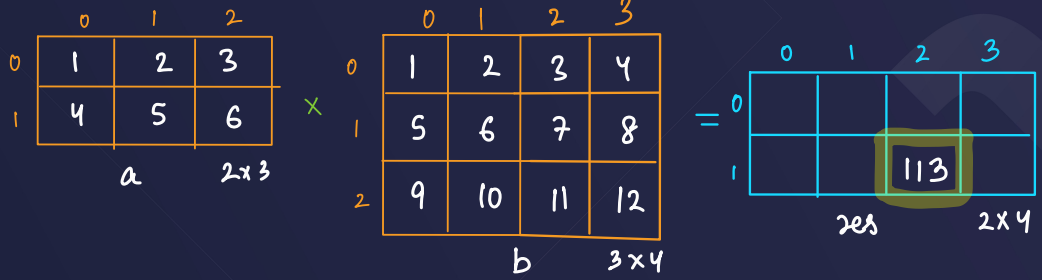


$$res[0][0] = a[0][0] * b[0][0] + a[0][1] * b[1][0] + a[0][2] * b[2][0]$$

$$res[1][2] = a[1][0] * b[0][1] + a[1][1] * b[1][1] + a[1][2] * b[2][1]$$

$$res[i][j] = a[i][0] * b[0][j] + a[i][1] * b[1][j] + a[i][2] * b[2][j]$$

$$= \sum_{r=0}^{r=n-1} a[i][r] * b[r][j]$$



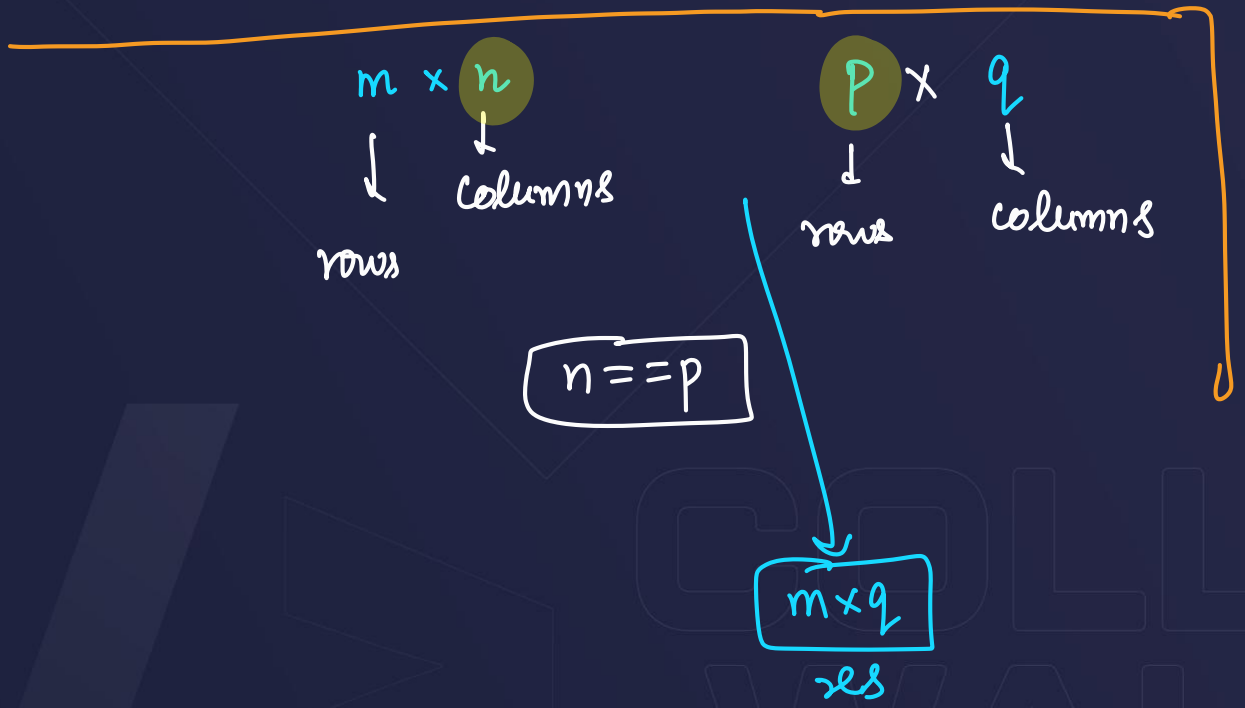

```
int res[m][q];   m=2, q=4
for(int i=0;i<m;i++){
    for(int j=0;j<q;j++){
        res[i][j] = 0;
        for(int k=0;k<p;k++){
            res[i][j] += a[i][k]*b[k][j];
        }
    }
}
cout<<endl;
```

res[1][2] = 0 1 4 7 113

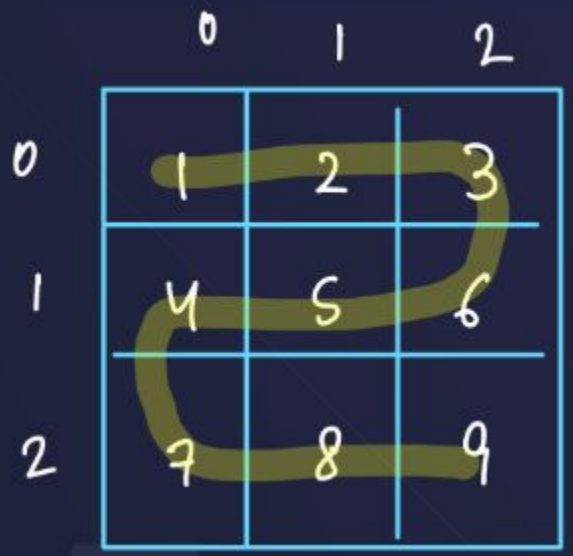
k = 0 1 2

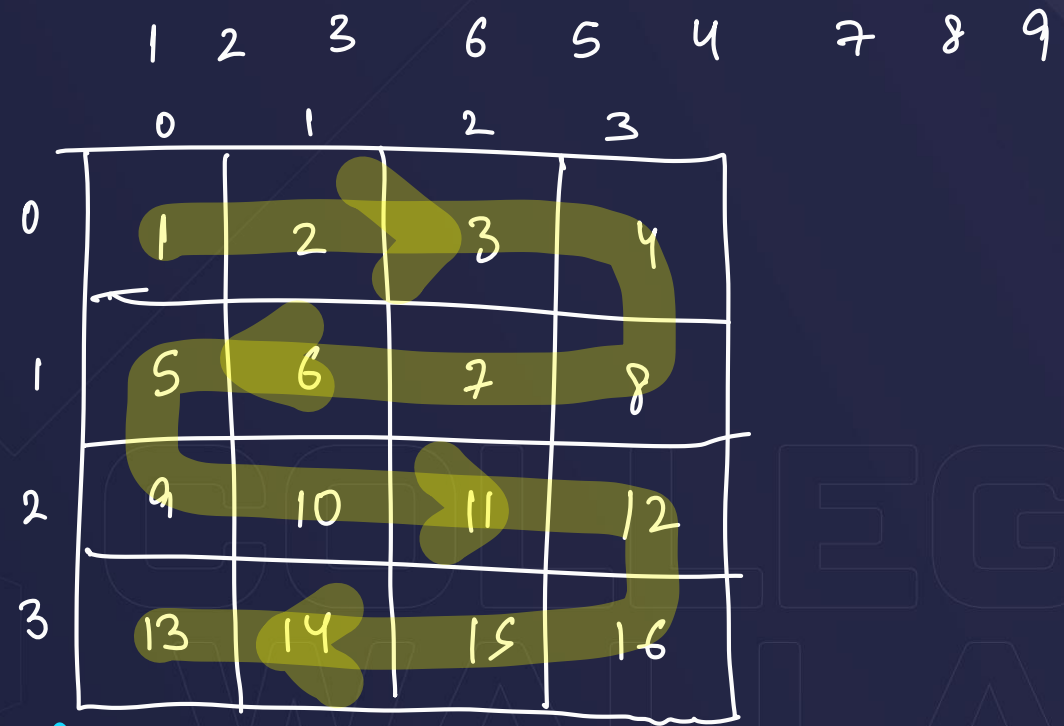
res[1][2] += a[1][k] * b[k][2]

Ques : Write a program to print the multiplication of two matrices given by the user.



Ques : Write a program to print the matrix in wave form.

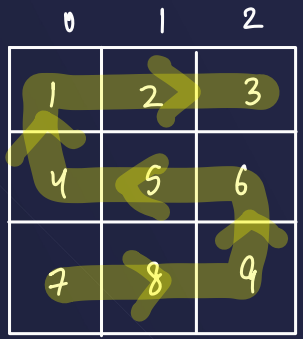




1 2 3 4 8 7 6 5 9 10 11 12 16 15 14 13

C.W.

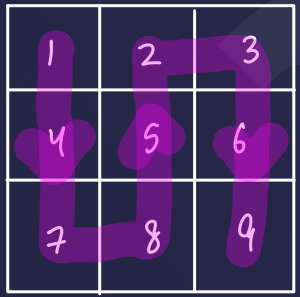
Q 1



Output :

7 8 9 6 5 4 1 2 3

Q 2



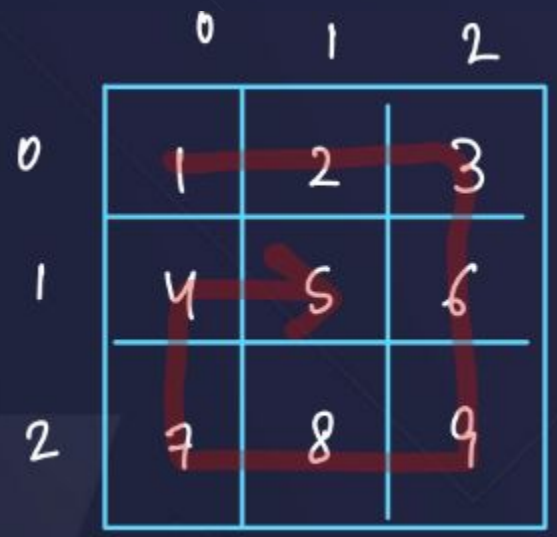
Column wise printing

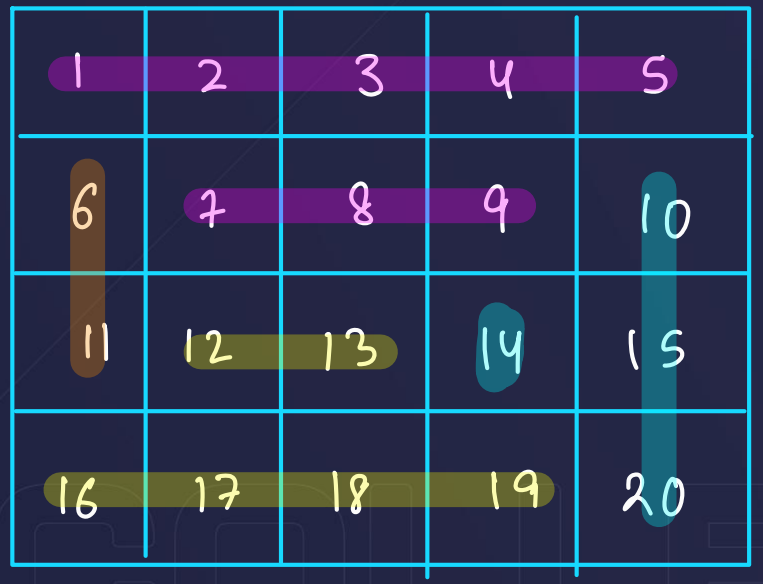
1 4 7 8 5 2 3 6 9

1 4 7 2 5 8 3 6 9

Ques : Write a program to print the matrix in spiral form.

[Leetcode 54]





Hint:

Right

Down

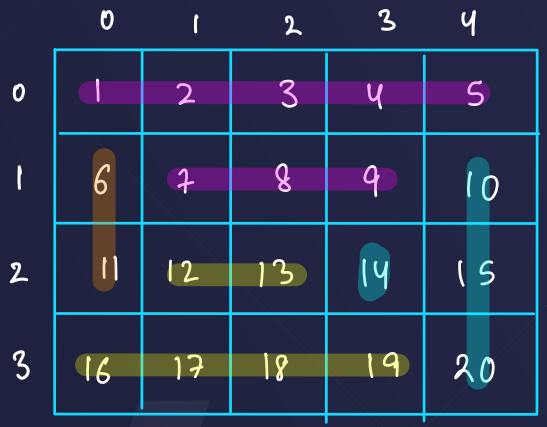
Left

Up

Output:

1 2 3 4 5 10 15 20 19 18 17 16

11 6 7 8 9 14 13 12



Hint:

Right

Down

Left

Up

1 loop ke andar

4 loops lagenge

minr

maxr

minc

maxr

Right → minr fix

minc to maxc

minr++;

Down → maxc fix

minr to maxr

maxc--


```
// left
for(int j = maxc; j >= minc ;j--){
|   cout << arr[maxr][j] << " ";
}
maxr--;
```

```
// Right
for(int j = minc ; j<=maxc ; j++){
|   cout << arr[minr][j]<<" ";
}
minr++;
```

```
// Down
for(int i = minr ; i<= maxr; i++){
|   cout << arr[i][maxc]<<" ";
}
maxc--;
```

```
// top
for(int i = maxr; i>=minr ; i--){
|   cout<< arr[i][minc]<<" ";
}
minc++;
```

```cpp
while(minr<=maxr && minc<=maxc){
    // right
    for(int j=minc;j<=maxc;j++){
        cout<<arr[minr][j]<<" ";
    }
    minr++;
    // down
    for(int i=minr;i<=maxr;i++){
        cout<<arr[i][maxc]<<" ";
    }
    maxc--;
    // left
    for(int j=maxc;j>=minc;j--){
        cout<<arr[maxr][j]<<" ";
    }
    maxr--;
    // up
    for(int i=maxr;i>=minr;i--){
        cout<<arr[i][minc]<<" ";
    }
    minc++;
} // 1 2 3 4 8 12 11 10 9 5 6 7
```

1 2 3 4 8 12 11 10 9 5 6 7 6

Thank you !!