

# 2D Arrays-1

Lecture-14

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# What and Why?

```
0 1 2 3 4 5 6 91 90 81 75 100 56 68
```

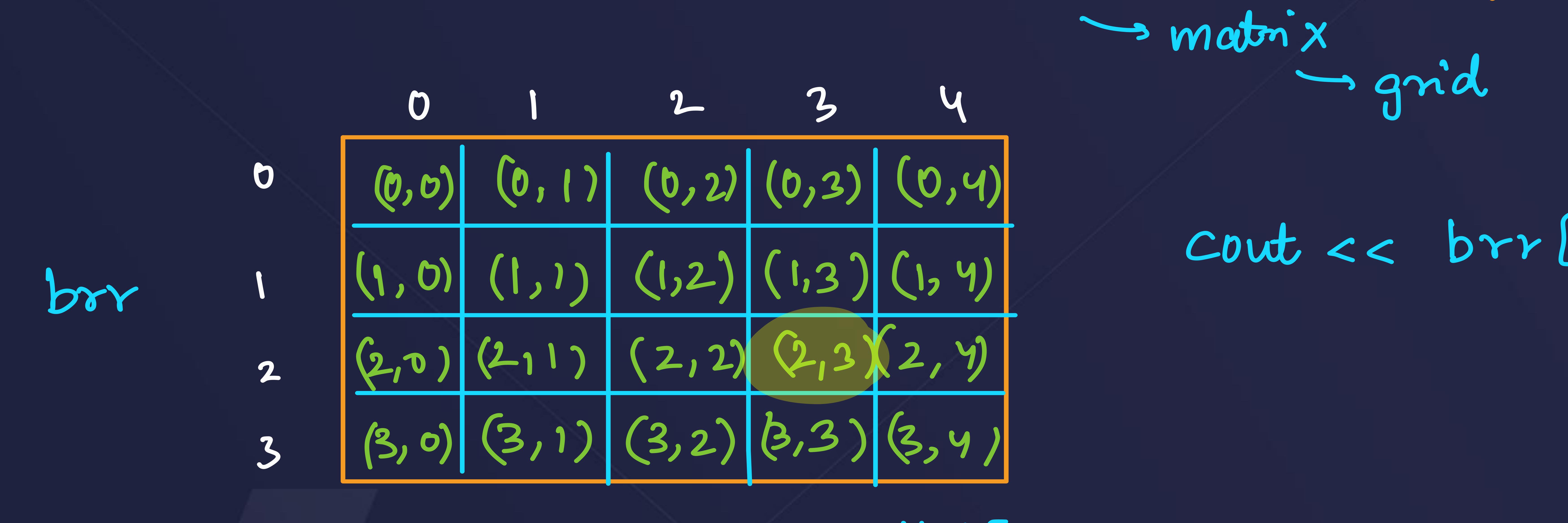
List

P,C,M -> 6 students
Tables

	95	65	
		56	
4	44		
	98	8-7	
82		88	
		8-9	



## Representation of 2D array - Indexing



Cout << by [2][3];

arr

arr index index - 0 to n-1



# Declaration of a 2-Dimensional Array

```
int arr[4][2];
```

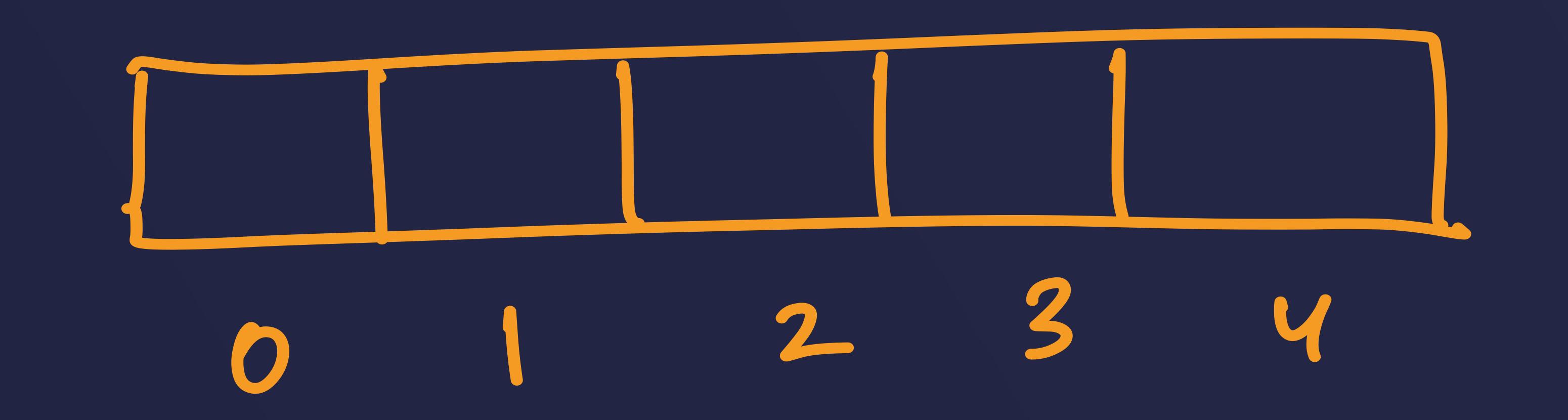
While initializing a 2D array it is necessary to mention the second (column) dimension, whereas the first dimension (row) is optional.

```
Correct int arr[2][3]; int arr[][3];
```

```
Incorrect intarr[2][];
```

```
int arr [][;
```

#### int alsi



### int arr [3][3];

$$arr[b][b] = 4;$$

$$am [1][2] = 8;$$

	8	

2D Arrays are also arrays of arrays



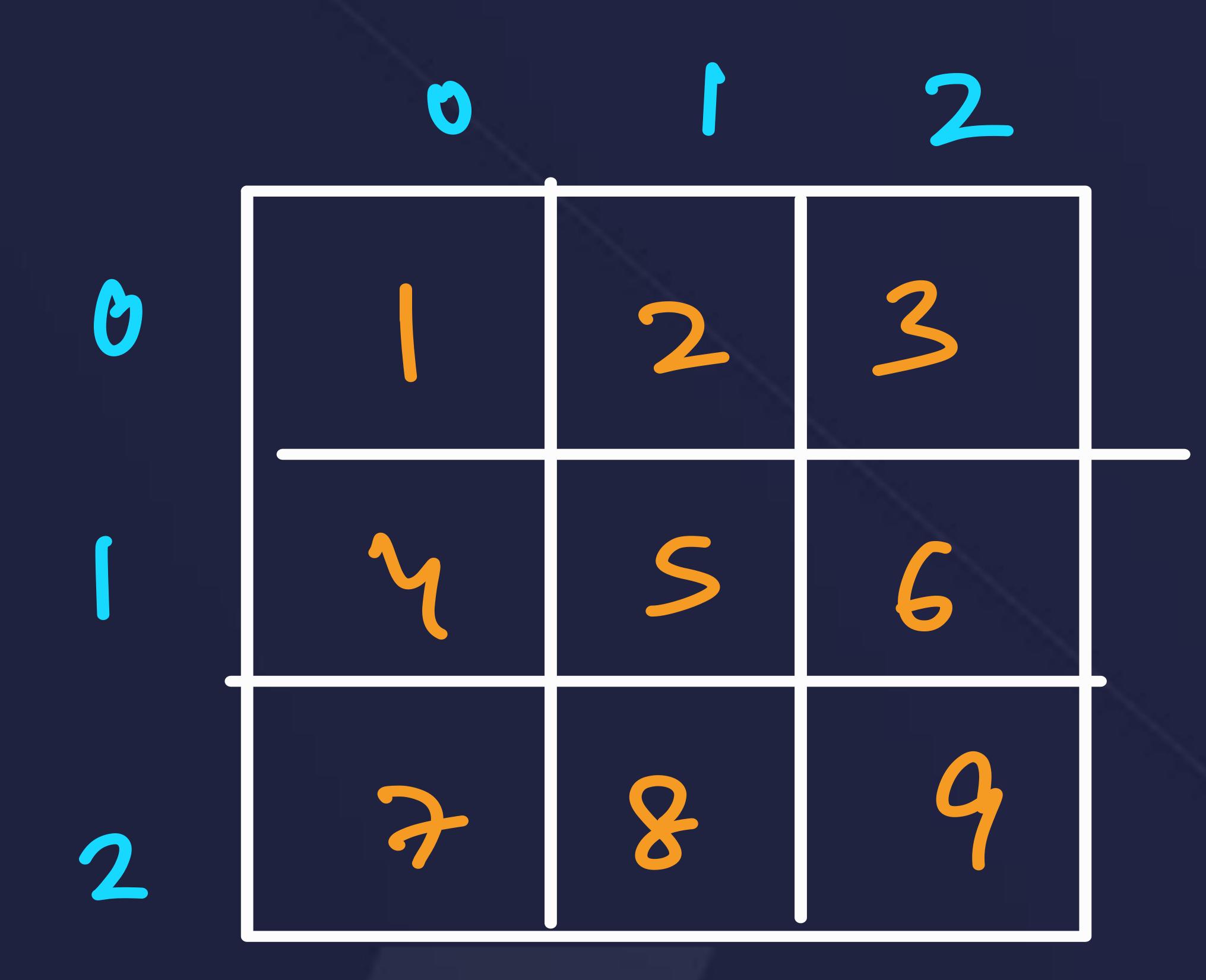
# Initialisation of a 2-Dimensional Array

```
int arr[4][2] = { {1234, 56 }, {1256, 43 }, {1434, 32 }, {1312, 96 } };
int arr[4][2] = { 1234, 56, 1256, 43, 1434, 32, 1312, 96};
\forall \int \arr[2][3] = \{ 12, 34, 56, 78, 91, 23 \};
int arr[][3] = {12, 34, 56, 78, 91, 23 };
int arr [2][] = \(\frac{1}{2}\), \(56\), \(78\), \(91\), \(23\)\);
```



### Traversal through 2D array





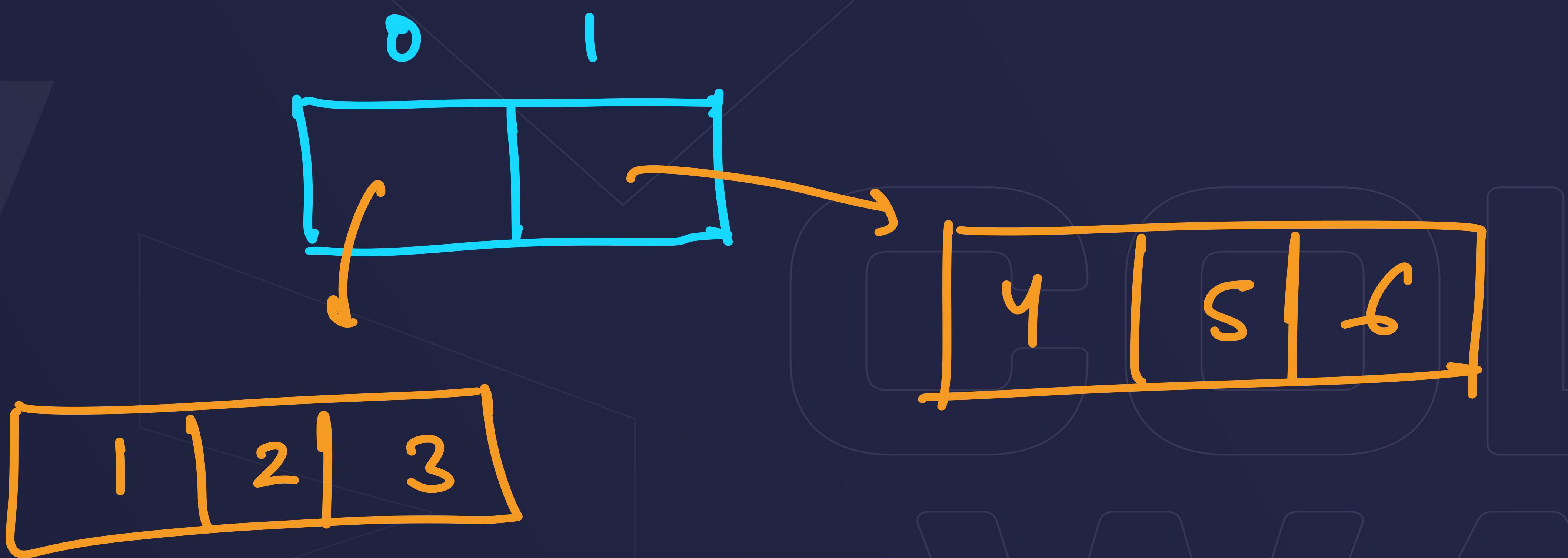
	ar [0][0]	an [b][i]	ar [6] [2]
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## Arrays of Arrays

	2	3
	5	6





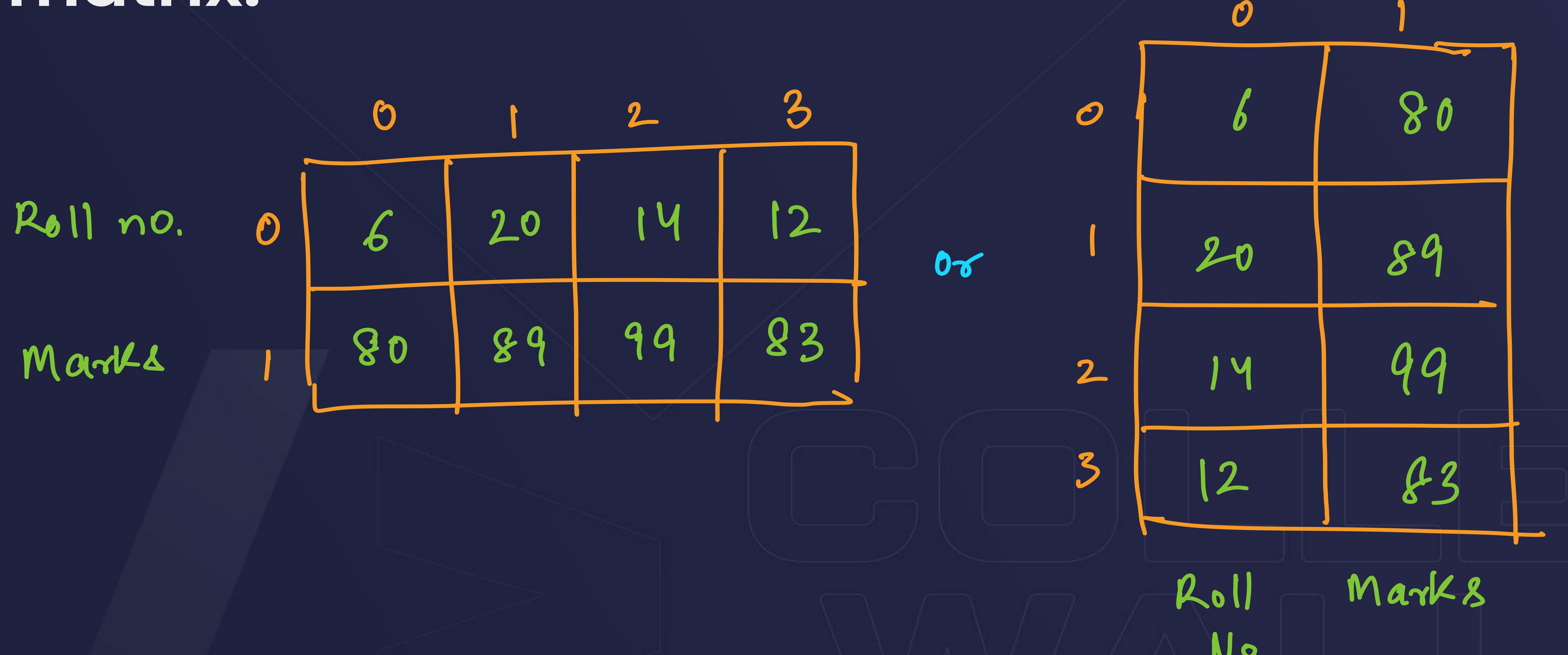
### Taking 2D array as input from the user

Very Simple



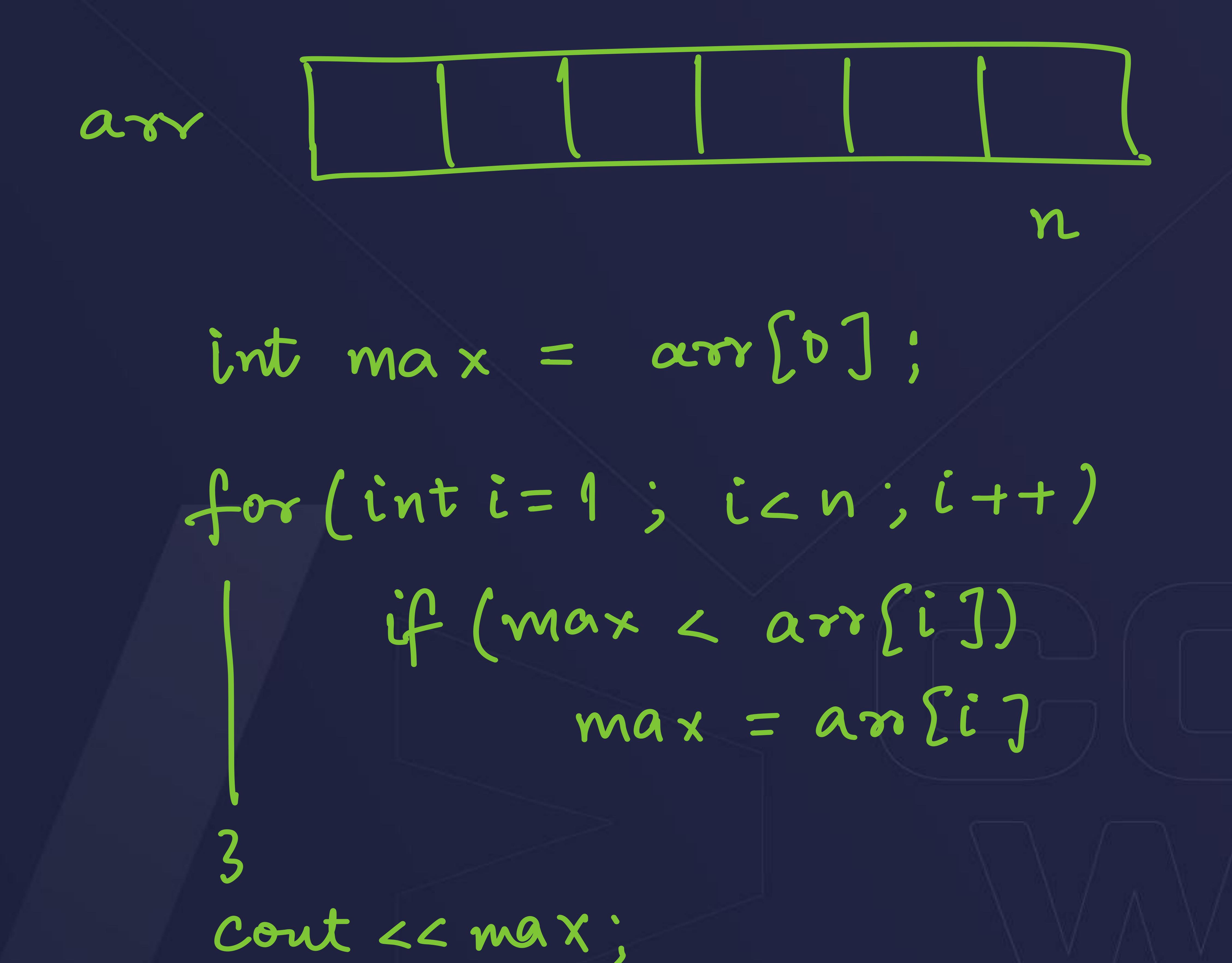


Ques: Write a program to store roll number and marks obtained by 4 students side by side in a matrix.





# Ques: Write a C++ program to find the largest element of a given 2D array of integers.

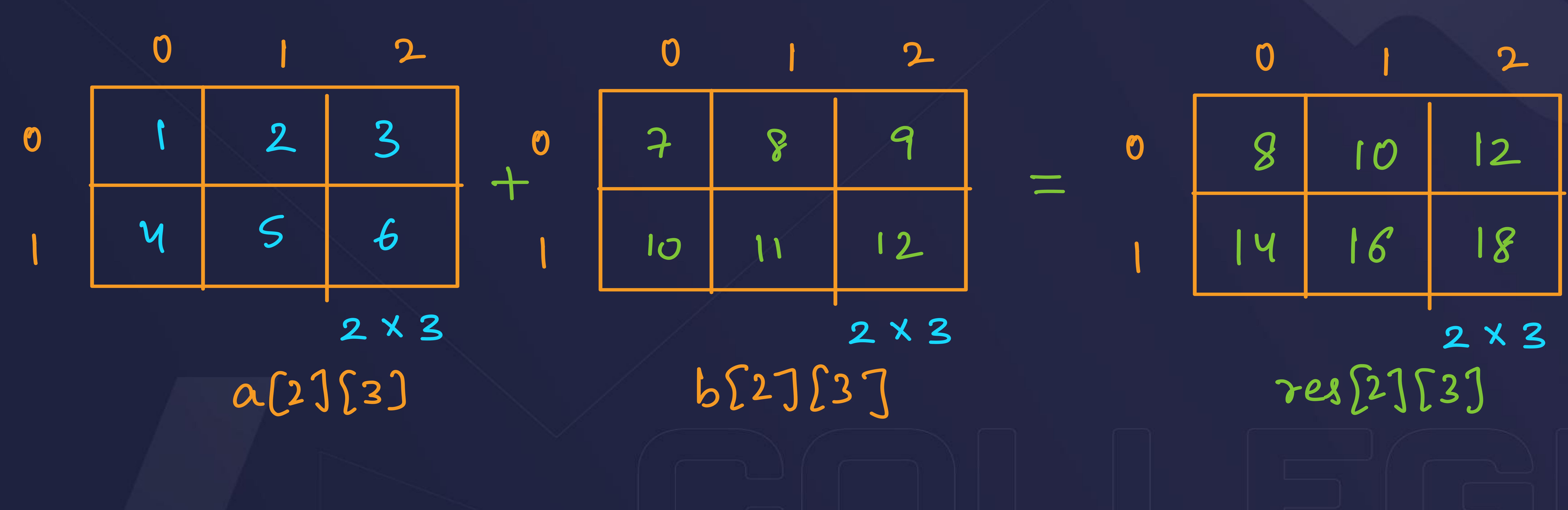




# Ques: Write a program to print sum of all the elements of a 2D matrix. Ditto Same > C.W. attempt



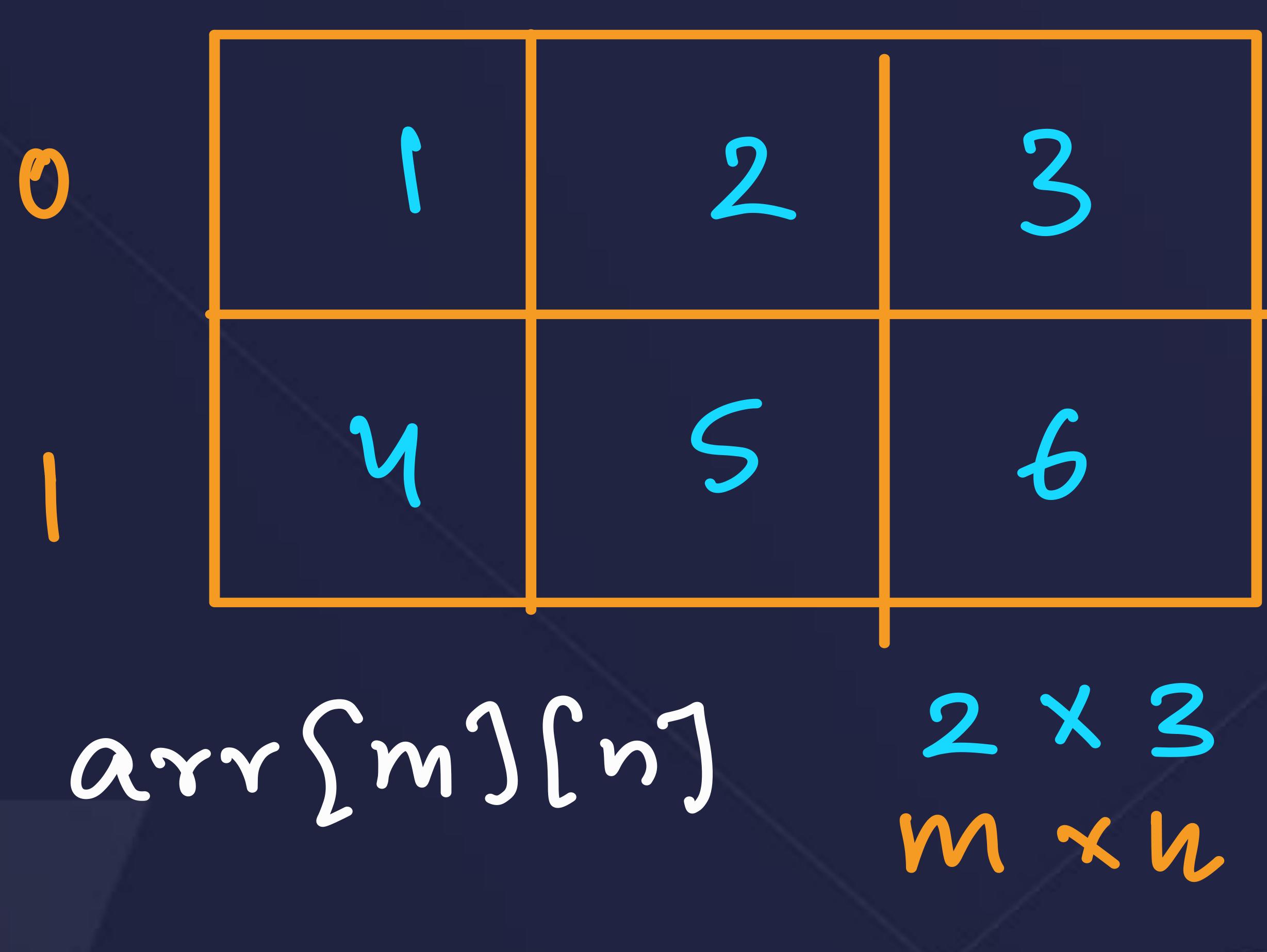
### Ques: Write a program to add two matrices.



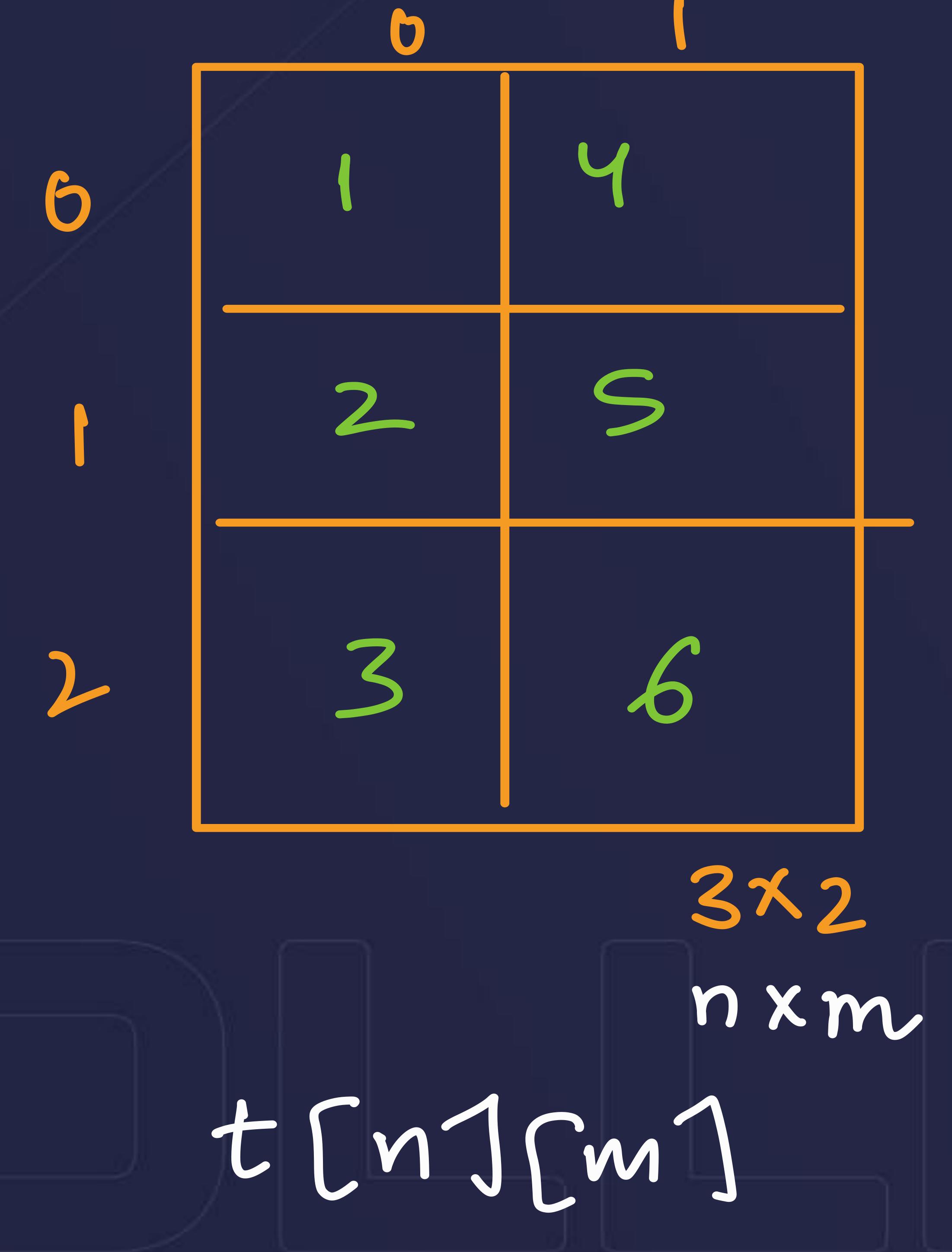


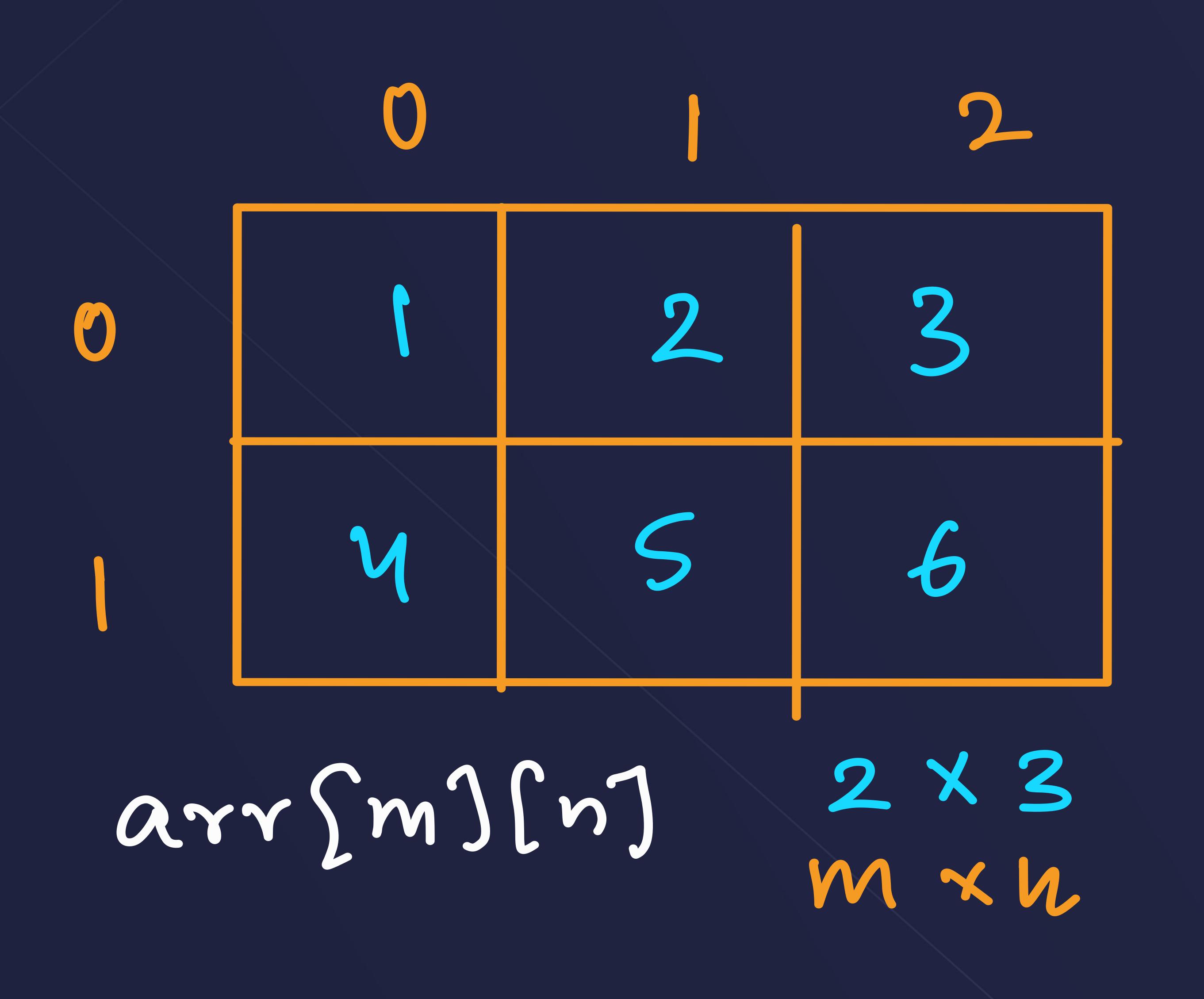
\*Ques : Write a program to print the transpose of the matrix entered by the user and store it in a new

matrix.		



$$(0,0)$$
  $(6,1)$   $(0,2)$   $(1,0)$   $(1,1)$   $(1,2)$ 





$$t[0][0] = arr[0][0]$$

$$t[0][1] = arr[1][0]$$

$$t[1][0] = arr[0][1]$$



Ques: Write a program to change the given matrix with its transpose.

[Leetcode 867]

SKILLS

Qu, you are given a motrix /2D-Array of size (nxn). Change this motrix into its transpose.



				5	
			(0,2)	(0,3)	
			(1, 2)	(1,3)	
2	(2,0)		(2,2)	(2, 3)	
3	(3,0)	(3,1)	(3,2)	(3,3)	

			2	5				2	3
		522	33	J3 <sub>M</sub> M			52	4	X <sup>1</sup> 13
	755	6		8		28	6	76	8/14
2	3 9				2	3			25
3	3				3		148	15	16
			C43643					C43643	



#### Ques: Write a program to rotate the matrix by 90 degrees clockwise. Leetcode 48

1	2	3	7	4	1
4	5	6	8	5	2
7	8	9	9	6	3

# Hint 1: Transpose

1 2 3 4 5 6 transpose 2 5 8 7 8 9 3 6 9

8 5 2 9 6 3

Each row of transposed waterx

trans o Do

	3		
5		8	
		2	
13			

			13
2	6		
3			
	8	12	6

		3	
13	5		
		2	
15		3	
16	8		

neworde

transpose

5 9 13

				13
	2	6		
	3			
3		8	12	16



- 1) Matrix Multiplication
- 2) Spiral Printing

nvext Lecture

# Thankyou!