int [] arr → 0th index address

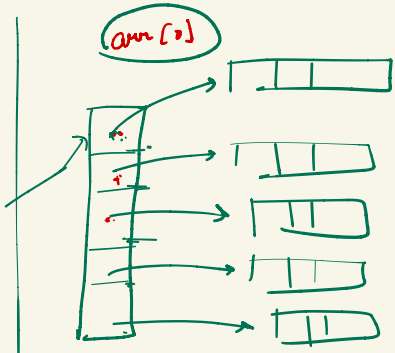
arr = new int [5]

2d array → array of arrays

array of integers

array of String

arr[0]



int [][] arr = new int [5] [3]

number of rows

number of columns

arr[2][0], arr[2][1], arr[2][2]

arr[1]

arr[2][0]

arr[2]

arr[i][j]

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

last row → reverse order

16 15 14 13

12 11 10 9

8 7 6 5

4 3 2 1

```java
public static void main(String[] args) {
    Scanner scn=new Scanner(System.in);

    System.out.println(x: "Enter the number of rows");
    int n=scn.nextInt();

    System.out.println(x: "Enter the number of columns");
    int m=scn.nextInt();

    int[][] arr=new int[n][m];

    System.out.println("Enter "+n*m+" numbers for your matrix");

    for(int i=0; i<n; i++){
        for(int j=0; j<m; j++){
            arr[i][j]=scn.nextInt();
        }
    }

    System.out.println(x: "Your matrix is this neo");

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

        System.out.println();
    }
}
```

arr[2][3] → 12

Ques Create 2d array, take input, find sum of whole 2d array.

```java
int sum=0;

for(int i=0; i<n; i++){
    for(int j=0; j<m; j++){
        int ele=arr[i][j];

        sum=sum+ele;
    }
}

System.out.println("The sum of whole array is "+sum);
```

1) ~~Search~~ → create a search function.

2) Compare

3) row sum equal

4) col sum equal.

```java
public static boolean search(int[][] arr, int tar){
    int n=arr.length;
    int m=arr[0].length;

    for(int i=0; i<n; i++){
        for(int j=0; j<m; j++){
            if(arr[i][j]==tar){
                return true;
            }
        }
    }

    return false;
}
```

n=3, m=4

	0	1	2	3
0	1	2	3	4
1	5	6	4	9
2	9	9	9	9

tar = 10

1) Two arrays are equal if they have equal number of rows, columns and every all element is equal.

1	2	3
4	5	6
7	8	9

1	2	3
4	5	6
7	8	10

n1 = 3
m1 = 3

n2 = 3
m2 = 3

```java
// returns true if arr1,arr2 is same else false
public static boolean isSame(int[][] arr1, int[][] arr2){
    int n1=arr1.length;
    int m1=arr1[0].length;

    int n2=arr2.length;
    int m2=arr2[0].length;

    if(n1!=n2 || m1!=m2){
        return false;
    }

    for(int i=0; i<n1; i++){
        for(int j=0; j<m1; j++){
            if(arr1[i][j]!=arr2[i][j]){
                return false;
            }
        }
    }

    return true;
}
```

arr1[i][j]

arr1[0][2]

arr2[0][2]

i = 0 ... 2

Ques Check if sum of every column is equal.

Ques Check if sum of every row is equal

n = 4

m = 3

	0	1	2
0	1	5	4
1	2	3	5
2	5	0	5
3	6	2	2

first_row_sum = 10

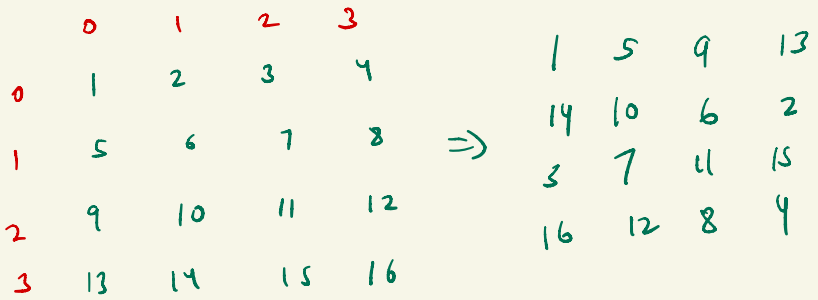
```java
public static boolean is_row_sum_equal(int[][] arr){
    int n=arr.length;
    int m=arr[0].length;

    int first_row_sum=0;

    int row=0;
    for(int col=0; col<m; col++){
        first_row_sum=first_row_sum+arr[row][col];
    }

    for(int i=1; i<n; i++){
        int row_sum=0;

        for(int j=0; j<m; j++){
            row_sum=row_sum+arr[i][j];
        }

        if(first_row_sum!=row_sum){
            return false;
        }
    }

    return true;
}
```

else

0,0 1,0 2,0

0,1 1,1 2,1

0,2 1,2 2,2




```java
public static void columnWave(int[][] arr, int n, int m){

    for(int col=0;col<m; col++){
        if(col%2==0){
            for(int row=0; row<n; row++){
                System.out.print(arr[row][col]+" ");
            }
        } else {
            for(int row=n-1; row>=0; row--){
                System.out.print(arr[row][col]+" ");
            }
        }

        System.out.println();
    }
}
```