23rd Feb

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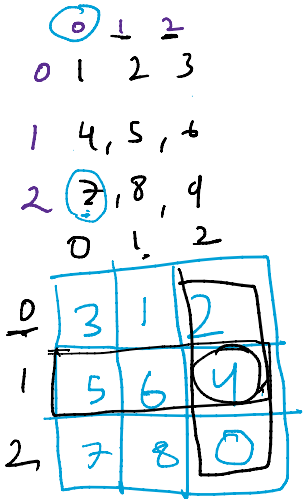
Saddle Point :-

https://www.geeksforgeeks.org/saddle-point-matrix/



1. min in row
2. Max in Col

[1] [2]

```
void SaddlePoint(arr){
    res = -1
for(i=0; i<arr.length; i++){
    curr = arr[i][0]; curr_col = 0
    for(j=1; j<arr[0].length; j++){
        if(curr > arr[i][j]){
            curr = arr[i][j];
            curr_col = j;
        }
    }
    flag = true;
    for(j=0; j<arr.length; j++){
        if(arr[j][curr_col] > curr){
            flag = false;
            break;
        }
    }
    if(flag == true) res = curr;
}
Sout(res);
}
```

Int Can we have multiple Saddle Points in an array ?

	0	1	2
0	4	6	7
1	10	15	9
2	33	21	12

res = ~~-1~~ 12

i = ~~0~~ 2

curr = ~~4 10 9 33 21~~ 12

c.c = ~~0~~ 2

j = ~~1 2~~ 3

flag = T

i = ~~0 1 2~~ 3

```java
public static int saddlePoint(int[][] arr) {
    int res = -1;
    for (int i = 0; i < arr.length; i++) {
        int curr = arr[i][0], currCol = 0;
        for (int j = 1; j < arr[0].length; j++) {
            if (curr > arr[i][j]) {
                curr = arr[i][j];
                currCol = j;
            }
        }
        boolean flag = true;
        for (int j = 0; j < arr.length; j++) {
            if (arr[j][currCol] > curr) {
```

flag = 1

$j_2 = 0 \times 2 3$

```
        boolean flag = true;
        for (int j = 0; j < arr.length; j++) {
            if (arr[j][currCol] > curr) {
                flag = false;
                break;
            }
        }
        if (flag) {
            res = curr;
        }
    }
    return res;
}
```

Search in a sorted matrix

1000

6

5 < 6

3 < 6

6 < 9

6 < 7

6 > 1

2 < 6

[1000] [1]

1000

1500

20 23 23 23

23 23 23 23

23 23 23 23

22

Transform to Chessboard ↓ = 0 → 1] swap cols | ↓ = 1 → 0] swap rows

0	1	1	0
0	1	1	0
1	0	0	1
1	0	0	1

	0	1	2	3
0	1	0	1	0
1	1	0	1	0
2	0	1	0	1
3	0	1	0	1

1	0	1	0
0	1	0	1
1	0	1	0
0	1	0	1

i%2

1 0 1 0

1 0 1 0

0

0 1 0

1

1 0 1