https://course.acciojob.com/idle?question=e469460a-11cf-480b-b950-02efad208e6b

MEDIUM

Max Score: 40 Points

Search A 2D Matrix

You are given a 2D matrix `mat` of size `m x n`. Each row of `mat` has elements sorted from left to right. Also the first(leftmost) element of each row is greater than the last(rightmost) element of previous row.

You are also given an integer `x`, Search for this `x` in `mat`, return `true` if `x` is present in `mat`, else return `false`.

Input Format

First line contains three space-separated integers `m n`, which is the size of matrix `mat`

Next `m` lines contains `n` space separated integers.

Last line contains a single integer `x`, which is to be searched in `mat`

Output Format

Return `true` or `false`, according to the conditions given above

Example 1

Input

```
3 4
1 3 5 7
10 11 16 20
23 30 34 60
10
```

Output

```
true
```

Explanation

x = 10, is present in middle row first column.

Example 2

Input

```
3 4
1 3 5 7
10 11 16 20
23 30 34 60
12
```

Output

```
false
```

Constraints

1 <= `m, n` <= 1000

-10^4 <= `mat[i][j]` <= 10^4

Topic Tags

- **Conditionals**
- **2D-Arrays**
- **Binary Search**

My code

// in java

```
import java.util.*;

public class Main {
    public static boolean SearchA2DMatrix(int[][] a, int x) {
        //Write your code here
            // Return true or false
                // int n=mat.length;
                // int m=mat[0].length;
                // int p=0;//point in which row value may be
                // while(true)
                //      {
                //              if(p==n || mat[p][0]>x)
                //                      break;
                //              p++;
                //      }
                // int q=0;
                // while(true)
                //      {

                //              if(q==m ||mat[p][q]>x)
                //                      break;
                //              if(mat[p][q]==x)
                //                      return true;
                //              q++;
                //      }
                // return false;

                int lo = 0;
                int n = a.length;
                int m = a[0].length;
```

```
        int hi = n*m-1;
        while(hi>=lo)
        {
            int mid = (hi+lo)/2;
            int row = mid/m;
            int col = mid - row*m;
            if(a[row][col]<x){
                lo = mid+1;
            }
            else if(a[row][col]>x){
                hi = mid-1;
            }
            else{
                return true;
            }
        }
        return false;
}
public static void main(String[] args) {
    Scanner sc = new Scanner(System.in);
    int m = sc.nextInt();
    int n = sc.nextInt();
    int[][] mat = new int[m][n];
    for(int i = 0; i< m; i++) {
        for(int j = 0; j<n; j++)
            mat[i][j] = sc.nextInt();
    }
    int x = sc.nextInt();
    if(SearchA2DMatrix(mat, x))
        System.out.println("true");
```

```
        else
            System.out.println("false");
    }
}
/*public static boolean SearchA2DMatrix(int[][] a, int x) {
        //Write your code here
            // Return true or false
                int lo = 0;
                int n = a.length;
                int m = a[0].length;
                int hi = n*m-1;
                while(hi>=lo){
                        int mid = (hi+lo)/2;
                        int row = mid/m;
                        int col = mid - row*m;
                        if(a[row][col]<x){
                                lo = mid+1;
                        }
                        else if(a[row][col]>x){
                                hi = mid-1;
                        }
                        else{
                                return true;
                        }
                }
                return false;

    }
*/
```