You have to submit a zip file containing the codes and the zip file should be named as Assignment1_Name_RollNo. For eg. Assignment1_Abhay_210022. You also have to submit a pdf file which includes the logic behind your code and it should have the same name as the zip file. The last date for the submission will be **22nd December(Friday).**

Q1. You are given an m x n integer matrix with the following two properties:

- Each row is sorted in non-decreasing order.
- The first integer of each row is greater than the last integer of the previous row.

Given an integer target, return true *if the target is in* matrix *or* false *otherwise*.

Q2. Given a sorted array of integers and an integer target, return indices of the two numbers such that they add up to the target in 2-D matrix as there can be more than one pair of such elements.

Eg. Array=[1,2,2,3,5,7,8,9,11] Target=12

Output should be [[0,8],[3,7],[4,5]]

Q3. A peak element is an element that is strictly greater than its neighbors.

Given a **0-indexed** integer array nums, find a peak element, and return its index.There is exactly one peak in the array.

Eg. - Array=[1,2,2,3,4,5,8,11,8,5,3,3,2,1]

Then the peak of the array is 11 and output should be 7.

Q4. Given an array of integer nums that is sorted in descending order, and an integer target, write a function to search target in nums. If the target exists, then return its index. Otherwise, return -1.

Q5. Bob likes to destroy buildings. There are N buildings in a city, i-th building has some no of floors given in an array. Bob can do the following operation. Choose a building, and destroy its uppermost floor with cost h. Where h is the building' height before removing the floor You can do this operation any number of times but total cost should be less than or equal to K Since you don’t like tall buildings you want to decrease their heights. You have to minimise the maximum height of buildings and report this height (height of tallest among them after operations).

• Input

First line of input consists of the number of test cases T. Every test case has two lines: the first line contains two integers N and K , and the next line has N integers A1, A2, . . .

- Output

For each test case, output a line containing the answer for that test case.

- Sample Input

```
3
5 23
1 3 2 4 5
5 3000000
0 1000000 2 5 99999
3 9
3 3 3
```

- Sample Output

```
2
999997
2
```