Largest Submatrix

You are given an matrix M (consisting of nonnegative integers) and an integer K. For any submatrix of M' of M define min(M') to be the minimum value of all the entries of M'. Now your task is simple: find the maximum value of min(M') where M' is a submatrix of M of area at least K (where the area of a submatrix is equal to the number of rows times the number of columns it has).

Input

The first line contains a single integer T (T ≤ 10) denoting the number of test cases, T test cases follow. Each test case starts with a line containing three integers, R (R ≤ 1000), C (C ≤ 1000) and K (K ≤ R * C) which represent the number of rows, columns of the matrix and the parameter K. Then follow R lines each containing C nonnegative integers, representing the elements of the matrix M. Each element of M is ≤ 10^9

Output

For each test case output two integers: the maximum value of min(M'), where M' is a submatrix of M of area at least K, and the maximum area of a submatrix which attains the maximum value of min(M'). Output a single space between the two integers.

Example

Input:

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

Output:

```
1 4
8 2
```