UVa Online Judge

12481 K-Neutral Rectangles

Given an $N \times M$ rectangle of integers, find the area of the largest sub-rectangle such that, each cell of the sub-rectangle, $R_{i,j}$, is K-**neutral cell**. A cell, $R_{i,j}$, is K-neutral, if absolute difference between the values of $R_{i,j}$ and each of its neighbors in horizontal and vertical direction is not more than K. The cells $R_{i-1,j}$, $R_{i+1,j}$, $R_{i,j-1}$ and $R_{i,j+1}$ are the four neighbors of the cell $R_{i,j}$. The neighborhoods should be considered only in the new sub-rectangle, not in the original rectangle. For example,

9	**30**	**20**	**25**	**10**
10	1	3	3	**9**
0	2	3	4	**7**
1	**7**	**11**	**10**	**8**

For $N = 4$, $M = 5$ and $K = 1$ in the above rectangle, the largest K-neutral sub-rectangle is

1	3	3
2	3	4

Input

Input starts with an integer T (≤ 100), denoting the number of test cases. Each test case starts with three integers N, M and K ($1 \leq N, M \leq 1000$, $0 \leq K \leq 100000$). Each of the next N line will contain M integers $R_{i,j}$ ($0 \leq R_{i,j} \leq 10000000$).

Output

For each case print the case number and the area of the largest K-neutral sub-rectangle.

Sample Input

```
2
4 5 1
9 30 20 25 10
10 1 2 3 9
0 2 3 4 7
1 7 11 10 8
2 2 1
1 3
4 6
```

Sample Output

```
Case 1: 6
Case 2: 1
```