

IUT 4th National ICT Fest 2012



K

K-Neutral Rectangles

Given an N X 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	2	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	2	3
2	3	4

Input

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

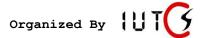
Output

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

Sample Input	Sample Output		
2	Case 1: 6		
4 5 1	Case 2: 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			

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