D. R2D2 and Droid Army

An army of n droids is lined up in one row. Each droid is described by m integers $a_1, a_2, \ldots, a_m$, where a_i is the number of details of the ith type in this droid's mechanism. R2-D2 wants to destroy the sequence of consecutive droids of maximum length. He has m weapons, the ith weapon can affect all the droids in the army by destroying one detail of the ith type (if the droid doesn't have details of this type, nothing happens to it).

A droid is considered to be destroyed when all of its details are destroyed. R2-D2 can make at most k shots. How many shots from the weapon of what type should R2-D2 make to destroy the sequence of consecutive droids of maximum length?

Input

The first line contains three integers n, m, k ($1 \leq n \leq 10^5$, $1 \leq m \leq 5$, $0 \leq k \leq 10^9$) — the number of droids, the number of detail types and the number of available shots, respectively.

Next n lines follow describing the droids. Each line contains m integers $a_1, a_2, \ldots, a_m$ ($0 \leq a_i \leq 10^8$), where a_i is the number of details of the ith type for the respective robot.

Output

Print m space-separated integers, where the ith number is the number of shots from the weapon of the ith type that the robot should make to destroy the subsequence of consecutive droids of the maximum length.

If there are multiple optimal solutions, print any of them.

It is not necessary to make exactly k shots, the number of shots can be less.

Examples

Input	Output
5 2 4 4 0 1 2 2 1 0 2 1 3	2 2
3 2 4 1 2 1 3 2 2	1 3

Note
In the first test the second, third and fourth droids will be destroyed.
In the second test the first and second droids will be destroyed.

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binary search, data structures, two pointers