

Problem H - Here to battle!

Andy aspires to be a Pokemon Master. The first step to becoming a Pokemon Master is to battle gyms.

In Andy's city, gyms are distributed as a $N \times M$ grid (N rows and M columns). The power levels of all the pokemon in the city are recorded in a city-wide pokemon registry, represented as an array a of length $NM + 5$. Each cell in the grid is one gym. In $\text{gym}[i][j]$ (for any i in $[0, N - 1]$ and j in $[0, M - 1]$), there are exactly 6 Pokemon to battle. The combat power of each pokemon is located on the pokemon registry, with combat power $a(K_{ij}), a(K_{ij} + 1), \dots, a(K_{ij} + 5)$, where $K_{ij} := i \cdot M + j$.

Andy has been training pokemon for over 18 seasons, and has many pokemon with combat power (CP) within any signed 32-bit integer.

When Andy's pokemon with combat power C battles a gym, his reward is the sum of the combat power of that gym's pokemons with combat power at most C (since his pokemon will defeat all pokemon with lower combat power). More specifically,

$$\text{Reward}(C, \text{gym}[i][j]) = \sum_{i=0}^5 a[K_{ij} + i] \text{ where } a[i] \leq C$$

Andy's bike only has enough room to take one pokemon with him. This pokemon will be used to battle all the gyms.

Andy will battle each gym once and only once. Andy considers the gym defeated if his reward gained at the gym is at least L . Andy loves connected gyms. When using a pokemon of CP C , Andy measures his success $S(C)$ as the size of the maximum connected component of defeated gyms. A gym on location (i, j) is connected to gyms located directly north, west, south, and east of it.

Andy measures his efficiency as $S(C)/C$. Which CP pokemon should he take to maximize his efficiency?

Given the dimensions of Andy's city, all the gyms in Andy's city, a list of all the Pokemon combat power in each gym, find the combat power of the pokemon Andy needs to obtain maximum efficiency. In Andy's city, at least one gym can always be defeated.

Input

First line is the number of test cases T .

The first line of each test case has 3 integers, N , M and L .

$$1 \leq N \leq 100$$

$$1 \leq M \leq 100$$

$$1 \leq L \leq 10^9$$

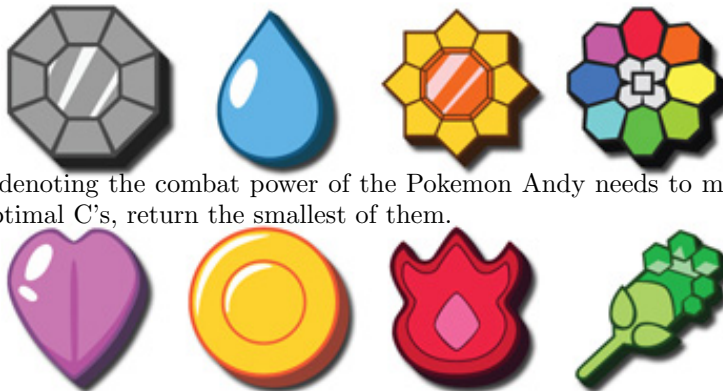
The next line contains $N \cdot M + 5$ integers representing the city-wide pokemon registry a .

$$a_0, a_1, \dots, a_{NM+4}$$

$$1 \leq a_i \leq 10^9$$

Output

A single number C , denoting the combat power of the Pokemon Andy needs to maximize his efficiency. If there are multiple optimal C 's, return the smallest of them.



Sample Input

```
2
2 2 10
1 2 3 4 5 6 7 8 9
2 2 10
1 2 3 4 5 600 700 800 900
```

Sample Output

```
6
5
```
