Judging Papers

Input file:	`standard input`
Output file:	`standard output`
Time limit:	2 seconds
Memory limit:	1024 megabytes

Panda, a highly respected professor, has submitted n papers to the *International Collegiate Programming Conference*. Each paper is judged independently by m anonymous reviewers who give it a score.

Reviews have seven levels, which correspond to scores:

- `Strong Reject`: -3
- `Reject`: -2
- `Weak Reject`: -1
- `Borderline`: 0
- `Weak Accept`: 1
- `Accept`: 2
- `Strong Accept`: 3

A paper is accepted if its total score (the sum of all m reviewer scores) is greater than or equal to a threshold k; otherwise, it is rejected.

After the reviewers submit their scores, there is a rebuttal phase. Panda can select a maximum of b distinct papers during this phase. A rebuttal is an argument aimed at improving the reviewers' evaluations for a selected paper. However, reviewers react differently, leading to these score changes:

- Reviewers who gave a high score (1 or higher) will react negatively to the rebuttal; their score is decreased by one level (e.g., 3 becomes 2, 1 becomes 0).
- Reviewers who gave a low score (0 or lower) will react positively to the rebuttal; their score is increased by one level (e.g., -3 becomes -2, 0 becomes 1).

Panda wants to strategically select **at most** b papers for a rebuttal to maximize the final number of accepted papers after all rebuttals are applied.

Input

The first line contains a single integer T ($1 \le T \le 1000$), denoting the number of test cases.

For each test case, the first line contains four integers n, m, k, b ($1 \le n \le 10^5$, $1 \le m \le 10$, $-30 \le k \le 30$, $0 \le b \le n$). n is the number of papers, m is the number of reviewers per paper, k is the acceptance score threshold, and b is the maximum number of papers that can be selected for a rebuttal.

The i-th of the next n lines contains m space-separated integers s_{ij} ($-3 \le s_{ij} \le 3$), representing the initial scores given by the j-th reviewer for the i-th paper.

It is guaranteed that $\sum n \le 2 \cdot 10^5$ over all test cases.

Output

For each test case, output an integer in one line, denoting the maximum number of papers that can be possibly accepted.

Example

standard input	standard output
2 5 3 2 1 -3 0 3 2 -2 -1 1 1 1 0 0 0 -1 -1 -1 3 2 -1 1 -1 -2 -3 -3 1 -3	2 1