J Judging Papers

Time limit: 1s



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.

Sample Input 1	Sample Output 1
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