Problem K
Assigning course

Time Limit: 2 seconds
Memory Limit: 512 Megabytes

Problem description

Assume that you are a staff of the university who is in charge of arranging lessons. Suppose you have N time slots, M professors and K lessons. A lesson or a time slot should be assigned to exactly one professor and each professor agrees to teach only one lesson in this semester.

For each professor, he will prefer some certain time slots among these N time slots, and prefer to teach some certain lessons among these K lessons. A professor will be satisfied iff you arrange him both his preferred lesson and preferred time slot. Your goal is to satisfy as many professors as you can.

Design an algorithm to determine how many professors can you satisfy at most.

Input

The first line of the input contains the number of datasets, which is not greater than 10.

Each test case begins with four integers N, M, K, L ($N, M, K \le 100, L \le 10^6$), denotes the number of time slots, the number of professors, the number of lessons and the number of descriptions.

The next L lines present descriptions with the standard form "A B C", means that Prof. B prefers to teach course C at time slot A. A is an integer that $1 \le A \le 100$, while B and C are strings of length less then 20.

Output

For each test, print the maximum number professors who are satisfied.

Example:

Input	Output
2 2 2 2 3 1 JAMES A1 1 JAMES B1 2 PETER B1 3 3 1 3 1 JAMES A1 2 PETER A1 3 BOB A1	2 1

A relax page, open to next page for the next challenge in your journey to the TOP.