
Card flipping

Input file: E.in
Output file: E.out
Time limit: 1 second
Memory limit: 64 megabytes

There are K cards numbered from 1 to K . Every card has each number from 1 to N written on it. Some numbers exist on the front side of the card and some on the back side. No number exists on both the sides of a card at the same time. These cards are placed on the table in a row such that only one side is visible. You are allowed to flip them any number of times. Your task is to flip some of them to maximize the number of different numbers on visible sides.

Input

The first line contains N and K , it's guaranteed $N \times K \leq 10^6$ and $N \geq 1$ and $K \geq 1$.

Each of the next K lines describes the cards. On each line, the first number is m ($0 \leq m \leq N$), denoting the count of numbers written on the visible side of the i_{th} card. Next m space-separated unique integers represent the numbers written on the visible side of that card, each between 1 and N .

Output

Output K characters on a single line. i ($1 \leq i \leq K$)-th character is equal to 1 if you flipped i_{th} card, otherwise 0. If there is more than one answer, output any of them.

Scoring

There are five subtasks:

1. $1 \leq N \leq 10$, $1 \leq K \leq 10$. Score 11 points.
2. $1 \leq N \leq K$. Score 8 points.
3. $1 \leq N \leq 100$. Score 15 points.
4. $1 \leq N \times K \leq 5 \cdot 10^4$. Score 30 points.
5. $1 \leq N \times K \leq 10^6$. Score 36 points.

Examples

E.in	E.out
5 4 2 1 3 2 3 4 2 2 4 3 1 2 3	1111
6 2 3 1 3 4 3 1 2 4	01