



Problem L. Slay the Spire

Little Cyan Fish is playing the game “Slay the Spire”. At any given moment, his character is in one of the m possible states. Initially, his character starts in the state s .

In the game, he has access to n cards. The effect of the i -th card is as follows:

- If the current state of your character is a_i , then deal b_i damage to the enemy and change the state to c_i .
- Otherwise, only the state will be changed to c_i .

Additionally, he has k potions. The effect of the i -th potion is to change the current state to x_i .

Now, the game starts. At any moment, he can choose to use any card or any potion. He may use these items in any order, but each item (card or potion) could be used at most once. His goal is to determine the maximum possible damage you can deal to the enemy.

Input

The first line of the input contains a single integer T ($1 \leq T \leq 5\,000$), indicating the number of test cases.

In each test case, the first line contains four integers n , m , k and s ($1 \leq n \leq 10^3$, $1 \leq m, k \leq 500$, $1 \leq s \leq m$), representing the number of cards, the number of states, the number of potions, and the initial state, respectively.

The next n lines of the input describe all the cards. The i -th line of these lines contains three integers a_i , b_i and c_i ($1 \leq a_i, c_i \leq m$, $1 \leq b_i \leq 10^9$), representing the effect of the i -th card.

The next line of the input contains k integers x_1, x_2, \dots, x_k ($1 \leq x_i \leq m$), describing the effects of all the potions.

It is guaranteed that over all test cases, none of the sum of n , the sum of m , and the sum of k exceeds 5000.

Output

For each test case, output a line with a single integer, representing the answer.

Example

standard input	standard output
1	600
6 5 2 1	
1 100 2	
1 100 4	
1 100 5	
1 200 5	
2 100 3	
3 100 1	
1 5	