go to sleep

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	256 megabytes

In specific dormitory 333, there's always a hard-solving problem for the residents, which is the time they sleep at night. There are n+1 residents in this dormitory, and everyone has their own sleeping schedule. Formally speaking, the i-th resident will go sleeping after or equal to moment t_i at night.

Obviously, nobody will go to bed as college arranged. In most cases, one may have quite enough energy when he is arranged to go to bed, then he would choose one strategy to consume his energy.

However, we'd better introduce the **friendship network** and **consuming network** in the dormitory before the strategies. The relationships between each resident in the dormitory can be either familiar or unfamiliar. Formally speaking, there exist m bidirectional friendships in the **friendship network**, each represented as (x_i, y_i), which means x_i and y_i are familiar with each other. It's obvious that the **friendship network** is static.

Every moment, all the residents whose point of energy is not above 0 will try to sleep while others will try to build **consuming network** out of the **friendship network** to consume their energy. Formally speaking, there exists a bidirectional relationship in the **consuming network**, each represented as (x_i, y_i), if and only if x_i and y_i are familiar with each other and the energy of either x_i or y_i is more than 0. Then the residents will choose different strategies to consume their energy as follows.

1. If the size of his consuming network is 1, that is, he is only able to play with himself, then he would choose to scroll on the phone and consume 1 point of energy before the next moment.
2. If the size of his consuming network is in [2,4], then he would choose to play a card game with his partners and consume 3 points of energy before the next moment.
3. If the size of his consuming network is in [5,8], then he would choose to play the Werewolf board game with his partners and consume 2 points of energy before the next moment.
4. Suppose that the size of his consuming network is more than 8, then he would choose to hold a party with his partners and consume 5 points of energy before the next moment.

By the time the i-th resident's energy is not above 0, he would choose to lie on the bed and try to sleep. If the moment is equal to t_i or even later, he would fall asleep immediately, and no one is able to wake him up from then on.

However, there's an annoying boy in the dormitory, Brz, which also belongs to the set of $n+1$ roommates. He would do an essential thing every night before sleeping — to facetime with Mandy, from the moment 0 to the moment Brz is satisfied to go sleeping.

Unfortunately, during this period, if anyone tries to sleep, he will have a hard time falling asleep, which means he would undergo rage towards the couple out of jealousy.

Specifically, at a certain moment, if the energy of i-th resident is not above 0 and that is the moment after or equal to the moment he intends to sleep, he would choose to sleep. However, if Brz is still facetiming at that moment, he would not fall asleep smoothly, and before the next moment, he'd conserve H points of rage. (At first, each of them has no point of rage) The i-th person has a limit of endurance v_i. If someone's total rage exceeds (strictly bigger than) his endurance v_i, he will regain C points of energy(that is, his points of energy are **reset** to C), while his point of rage will reduce to 0, at the same time, he'll form his consuming network immediately.

However, by the time Brz finishes his facetime with Mandy, Brz'll fall asleep at once at that moment, for he uses up all his energy after the facetime.

Tonight, the roommates in dormitory 333 are ready to go to sleep, the "reginvolver" Tangle is willing to go to sleep. However, Brz is happily facetiming with Mandy, he has no way to fall asleep to make a happy dream with his cute dream lover CX. Now Tangle desires to know, when can roommates in the dormitory all fall asleep. Can you find the answer for him?

By the way, the time starts at moment 0.

Input

The first line contains four integers $n, m, H, C (1 \le n \le 10^3, 0 \le m \le \min\{\frac{n(n-1)}{2}, 3\times10^3\}, 1 \le H \le 10^3, 1 \le C \le 10^3)$ with n representing the number of residents in the 333 dormitory, m representing the number of friendships. And the meanings of H and C are described above.

The second line contains $n+1$ integers. The i-th integer $t_i (0 \le t_i \le 10^3)$ represents the moment that the i-th resident intends to go to sleep. In particular, the (n+1)-th integer t_{n+1} represents the time that Brz finishes his facetime and goes to sleep.

The third line contains n integers. The i-th integer $e_i (0 \le e_i \le 10^3)$ represents the energy the i-th resident has initially.

The fourth line contains n integers. The i-th integer $v_i (0 \le v_i \le 10^3)$ represents the limit of endurance the i-th resident has.

There are m lines in the following. The i-th of the line contains two integers $x_i, y_i (1 \le x_i, y_i \le n, x_i \ne y_i)$, representing the i-th friendship. It is guaranteed that all the friendships are distinct.

Output

Output one line containing one integer T, representing the earliest moment all the residents fall asleep.

Examples

standard input	standard output
5 4 5 2 5 5 0 4 3 0 1 3 0 4 1 1 2 3 4 5 1 2 2 3 3 4 4 5	2
5 4 5 2 5 5 0 4 3 4 1 3 0 4 1 1 2 3 4 5 1 2 2 3 3 4 4 5	5

Note

In the example, the performance of each resident is:

- At moment 0.

As the energy of the 3rd resident is not above 0 and the time he intends to sleep is moment 0, he should go to sleep at the moment. But Brz is still facetiming, which makes the 3rd resident's rage point increase by 5.

For the 1st and the 2nd resident, their energy is both above 0. Due to the friendship between them, they would form a consuming network together. Note that although the 2nd and the 3rd residents are familiar, the 3rd resident has no energy now, so he wouldn't join their consuming network. So as the 4th and the 5th residents. So at moment 0, the 1st and 2nd residents would play a card game with each other while the 4th and 5th would do the same. Thus, all four residents would consume 3 energy.

- At moment 1.

For the residents other than the 3rd and 4th, they have run out of energy and so the point of energy is not above 0. As it's time for them to go to sleep, their anger point increased by 5 due to Brz's facetiming.

For the 3rd resident, it comes that he would regain 1 point of energy as his point of rage now is 5, above his endurance limit of 3. After he regains 1 point of energy, his rage is cleared. We know that the 4th resident still has 1 point of energy, so he would form a consuming network with 3. And they would consume 3 points of energy by playing a card game.

- At moment 2.

It is time for Brz to finish facetime. So he'll go to sleep at once. It is considered before others' activities at this moment.

In terms of rage, the 1st and the 2nd residents would regain 1 point of energy and clear their rage points. However, the 5th wouldn't regain any energy as his point of rage is 5, not above his endurance limit of 5. And as Brz has fallen asleep, he would sleep immediately at once.

Obviously, the 3rd and the 4th residents would do the same as the 5th do. They both fall asleep immediately.

As the 1st and the 2nd residents have regained 1 point of energy, they would form a consuming network together and play a card game, consuming 3 points of energy.

- At moment 3.

The 1st and the 2nd residents have depleted their energy, so they go to sleep immediately.

Now all the residents have fallen asleep. So the answer is 3.