Palindromic carols

Submission deadline:	**2019-01-04 11:59:59**
Evaluation:	**2.0000**
Max. assessment:	**2.0000** (Without bonus points)
Submissions:	1 / 25
Advices:	0 / 0

Christmas is coming and atmosphere at the North Pole is nervous. Elves from The Christmas Promotion Department are not at all happy with the fact that people adhere to Christmas traditions less and less and that Christmas is slowly becoming a holiday of stress, unreasonable shopping and delayed e-shop deliveries. Elves are especially bothered by the fact that it is nowadays very rare to hear Christmas carols in family households.

From that reasons elves decided to compose many new carols. Their inspiration comes from classical composers and thus they have begun to create palindromic carols (see description **at this link**). Palindromic means that carol sounds exactly the same regardless of whether it is being played standardly or backwards. Elves distinguish 5 different tones, labeled by letters of English alphabet 'a' - 'e'. A carol consists of a specific number of positions. Every time a carol goes over from a position to another one, a tone is played. However, not all positions can be linked to each other. Elves have a description of which position can follow which. A carol is therefore a sequence of different positions and tones starting and ending at some position. A carol is a palindrome, if tones in its sequence form a palindrome.

Elves are naturally interested in the question of how many different palindromic carols exist. Your task is to determine, for a given description of order of positions and a given starting position `x` and ending position `y` of a carol, how many palindromic carols starting at position `x` and ending at position `y` are there. In addition, because it is rather difficult to come up with a sufficient number of palindromic carols for some orders of positions (and because elves are tolerant to errors), in some cases a few tones are allowed to violate the condition of palindromicity. Precisely speaking, a number `K` is given and in the resulting carol there can be at most `K` such tones, whose exchange to another (correct) tones would form a correct palindrome.

In the input you are given the number of positions of a carol, the starting and the ending position and the list of allowed followups of positions. The starting and ending positions will always differ. In addition it is guaranteed that if you adhere to allowed followups of positions, you will never end up at the same position more than once. Because the result might be large, output it modulo `1000000007`.

Input Format:

- On the first line there are two numbers `N` and `K`, `2 ≤ N ≤ 500` and `0 ≤ K ≤ 5`. Number `N` specifies the number of positions and number `K` specifies the number of tones that do not have to meet the palindromicity requirement.
- The numbering of positions is zero-based; their numbers are thus `0, 1, ..., N - 1`.
- On the next line there are two numbers `x` and `y`, `0 ≤ x, y < N` and `x ≠ y`. These two numbers describe the starting and the ending position of sought-after carols, respectively.
- After that `N` rows follow, successively for positions `0` to `N - 1`. In the beginning of each row is a number describing the number of positions to which it is possible to go over to by playing a tone (this number may also be `0`). A space-separated list of pairs follows, where each pair describes a position and a tone, which is to be played in order to go over to this particular tone. Each such pair is represented by a number `p` and a character `c`, where `0 ≤ p < N` and `c` is an English alphabet letter in the range of 'a' - 'e'.
- No position is listed in its own list of possible followup positions and no position is listed in a list of possible followup positions more than once (not even in a combination with a different tone).

- There are always at least two positions, but there might be no dependencies in between positions whatsoever. This implies there might exist pairs of positions that do not depend on each other (not even transitively through another positions)
- You can assume the input is valid.

Output Format:

- Output consists of a single line, which contains the number of all possible palindromic carols starting and ending at given positions modulo `1000000007`

Classification Conditions:

1. To pass the compulsory tests (basic and small data tests), your solution has to return correct answers for at most 10 positions and 20 tone followups, where $K = 0$.
2. To pass the test on large dataset, your solution has to output correct answers within the time and memory limit for at most 500 positions and 5 000 tone followups, where $K = 0$.
3. To pass the test on dataset with allowed errors, your solution has to output correct answers within the time and memory limit for at most 500 positions and 5 000 tone followups, where $K \leq 5$.

- Tests based on the examples are divided into two different tests because of the limitations on the number of allowed errors. First example test examines the submitted program on the Input Examples 1 and 2 and is mandatory. The second example test checks the program on the Input Example 3 and is not mandatory.

Examples:

Input Example 1:

```
6 0
1 5
1 1 e
3 2 a 3 b 5 c
1 4 b
1 4 b
1 5 a
0
```

Output Example 1:

```
2
```

Input Example 2:

```
4 0
0 2
2 1 a 3 a
0
1 1 a
1 2 a
```

Output Example 3:

```
1
```