## 899   Colour Circles

A very colourful one-person game can be played as follows. First you select a set of colours. Then you draw at least three circles using some or all of the colours. You may use a colour more than once. There will be at least as many circles as there are colours. You then draw coloured arrows to connect some of these circles. Any number of arrows, with any colours, may be used to connect any pair of circles. You may draw two arrows in opposite directions if desired.

For example, if we use the four colours R, G, B, and Z and four circles then we could have the following situation:
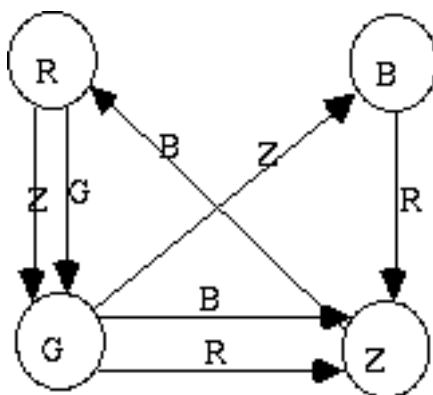
Three different circles are then picked from the set; two of them have a counter placed inside, while the third is the "target" circle. A counter may be moved from one circle to another along an arrow (in the direction of the arrow), but only if (i) the other counter is not in the circle being moved to, and (ii) the colour of the arrow is the same as the colour of the circle the other counter is in. A single counter may be moved several times in succession - they don't have to be moved alternately. The aim is to get one of the counters into the target circle using the smallest number of moves; if the target circle can't be reached, the game is "impossible".

For example, in the picture above, if one counter is in the B circle, the other counter is in the Z circle and the target is the G circle, then the game can only be won by moving the Z counter to the R circle (since a B arrow runs in that direction), which makes it possible to move the B counter to the Z circle along the R arrow, and the R counter can now be moved to the G circle along the Z arrow, for a total of three moves.

Input

Input will consist of descriptions of several games, using numbers instead of colours. The first line of each game description contains five numbers, N, R, S, T and M, where N is the number of circles in the game (they will be numbered 1 to N, with $N \leq 100$), R and S are the numbers of the circles the two counters start in, T is the number of the target circle, and M is the total number of arrows connecting the circles ($M \leq 5,000$). After this will come several lines (maximum length 60 characters each) giving the colours of the circles in order from circle 1 to circle N, with up to 20 numbers per line, separated by one or more spaces. The colours are denoted by numbers from 1 to N - some of these numbers may be unused. Then come M lines which define the arrows, in no particular order. Each contains three numbers; the first is the number of the starting circle, the second the number of the ending circle, and the third is the colour of the arrow. The input will be terminated by a line consisting of a five zeroes. The first example below describes the picture above.

Output

For each game description in the input, one line of output must be produced. This line should contain the minimum number of moves to complete the game, or '0' if the game is impossible.

Sample Input

```
4 2 3 4 7
1 2 3 4
1 4 3
1 4 4
2 3 1
3 1 2
4 2 3
4 3 2
4 3 1
5 3 4 1 8
2 3 2 1 4
2 1 2
4 1 5
4 5 3
5 1 4
3 2 1
3 2 2
5 3 3
3 5 1
0 0 0 0 0
```

Sample Output

```
3
4
```