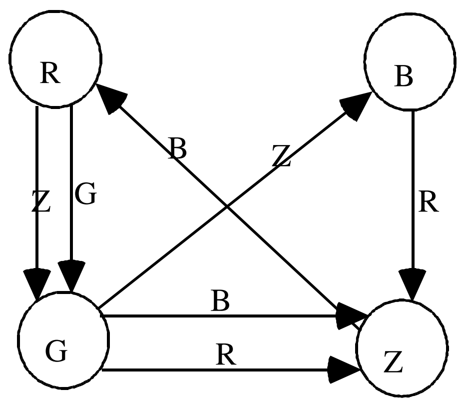
ACM Pacific NW Region Programming Contest
11 November 2000

PROBLEM G
Color Circles

A very colorful one−person game can be played as follows. First a set of colors is selected then a set of circles is drawn using some or all of the colors, with duplicates possible – there are at least as many circles as colors. These circles are then connected together in any way by colored arrows− any number of arrows, with any colors, may be used to connect any pair of circles. For example, if we use the four colors 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 correct direction), only if the other counter is not in the circle being moved to, and the color of the arrow is the same as the color of the circle the other counter is in. A 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 in the target circle, in the least 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 will be from a text file and will consist of descriptions of several games, using numbers instead of colors. The first line of each game description contains five numbers, N, R, S, T, M where N is the number of circles in the game (they will be numbered 1 to N, with N <= 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 <= 5,000). After this are several lines (maximum length 60 characters) containing N numbers giving the colors of the circles in order (1 to N), with up to 20 numbers per line, separated by one or more spaces. The colors 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 color of the line. The input will be terminated by a line consisting of a five zeroes. The first example below describes the picture above.

Output, which must be written to standard output (the screen), must be one number for each game description giving the minimum number of moves to complete the game, or 0 if the game is impossible.

The data file is called g**.dat**.

EXAMPLE

Input	**Output**
4 2 3 4 7	3
1 2 3 4	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	