Escape

SEASON 10 - SECOND ROUND

Georgi is currently somewhere in Hotel “Trakia” in Pazardzhik and must go out to go to the supermarket. At the same time, Emil is just entering the hotel and heading upstairs. Georgi and Emil are not exactly best friends and since Georgi is very shy and wants to get out of the hotel fast, he doesn’t want to meet Emil on the way down to the exit.

There are **N** different locations in the hotel, between which our two heroes can walk - they can be rooms, lobbies, etc. There are **M** connections between them - parts of stairways and hallways. All M connections are exactly 1 meter long. Georgi doesn’t know where Emil is going, but he knows Emil travels a distance of 1 meter for exactly **a** seconds. Georgi also knows his own speed - he travels 1 meter in exactly **b** seconds. Speeds of both of them are not affected by whether they’re going through a hallway, upstairs or downstairs. Yes, we know that normally people move with greater speed than 1 m/s, but in this statement the action takes place vary late at night and both our heroes are exhausted so they move slowly. Anyway, Georgi needs such a route, that he surely won’t meet Emil at any point on his way out. There are **K** exits in the hotel, situated at locations $\mathbf{e_1}$, $\mathbf{e_2}$, ... $\mathbf{e_K}$, and Emil is entering through the first exit, i.e. location $\mathbf{e_1}$ (obviously exits are entrances too). Help Georgi escape the hotel!

Input (escape.in)

You’ll have to solve several different scenarios in a single test. On the first line you are given the number of scenarios **T**. Every scenario is described in the following way: on the first line you are given 5 integer numbers **N**, **M**, **a**, **b** and **s** - the number of locations, number of connections, times (in seconds) needed by Emil and Georgi respectively to walk 1 meter and Georgi’s starting location. On each of the next M lines you are given two numbers - indices of locations, between which the corresponding connection is situated. On the next line stands the integer **K** - the number of exits. On the last line you are given K numbers - indices of locations of the exits.

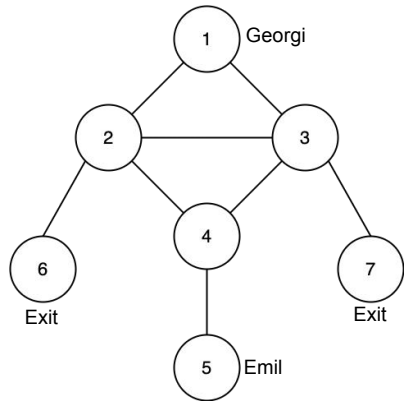
Output (escape.out)

For every scenario output the following: if Georgi can’t escape the hotel in a way that he’s sure he won’t meet Emil, print the number **-1** on a single line. Otherwise, on the first line print a single number **L** - number of locations in Georgi’s route. On the second line print L **different** indices of locations, describing the route. The first one must be Georgi’s starting location and the last one must be an exit. There must be a direct connection between every two consecutive locations. If there are several possible routes, describe any of them.

Constraints

$1 \le N, M \le 1\,000\,000$
$1 \le a, b \le 10^9$
$1 \le K, s, e_i, L \le N$
$1 \le T \le 10$
The sum of N, M over all scenarios ≤ 1 000 000

Example

Input	Output	Explanation
2 7 8 3 2 1 1 2 1 3 2 3 2 4 3 4 4 5 2 6 3 7 3 5 6 7 7 8 3 2 1 1 2 1 3 2 3 2 4 3 4 4 5 4 6 4 7 3 5 6 7	3 1 2 6 -1	First scenario:  Second scenario: