Black & White

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You are given an **simple, undirected, connected** graph with **n** nodes (numbered from 1 to n) and **m** edges, with each node coloured either black or white. There are a total **b** black nodes. All edges in the graph have weight = 1.

A node is called **magical** if it is a **white node** and **each black node** is at atmost k distance from it.

Your task is to find all magical nodes in the graph.

Formally, you need to find all such nodes u satisfying the following criteria-

```
colour(u) = White and ( ∀ Black nodes B, dist(u,B) <= k )
```

Note that the distance between any two nodes is taken as the number of edges along the shortest path between them.

Input Format

The first line denotes **t**, the number of test cases.

The first line of each test case contains 4 space seperated integers **n m b k**, where -

n denotes the number of nodes in the graph

m denotes the number of edges in the graph

b denotes the number of black nodes in the graph

k denotes the maximum distance at which the black nodes should lie from a white node

The next **m** lines are in the format **x y** denoting an edge between node **x** and node **y**.

The last line contains **b** space seperated integers denoting the node numbers of black nodes.

Constraints

$1 <= t <= 10$

$1 <= b <= 10$

$1 <= k <= n$

For 5 points: $n <= 500$

For next 5 points: $n+m <= 5 * 10^5$

Output Format

For each testcase, the first line should contain **n**, the number of magical nodes and the **next line** should contain n space seperated integers(**sorted** in ascending order) denoting the node number of these nodes.

Note - If there are no magical nodes, then output a single line containing 0.

Sample Input 0

```
1
6 6 2 2
1 2
2 4
1 3
3 5
4 6
6 5
3 6
```

Sample Output 0

```
2
2 5
```

Explanation 0

The graph given is

The white nodes are - 1,2,4,5.

Node 1 - 6 is at a distance of 3. Hence 1 is not Magical.

Node 2 - Both 3 and 6 are within a distance of 2. Hence 2 is Magical.

Node 4 - 3 is at a distance of 3. Hence 4 is not Magical.

Node 5 - Both 3 and 6 are within a distance of 2. Hence 5 is Magical.

The contest has not yet started. It begins in 2 hours.

Submissions: 0
Max Score: 8
Difficulty: Medium

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Current Buffer (saved locally, editable) C++14

```cpp
#include <cmath>
#include <cstdio>
#include <vector>
#include <iostream>
#include <algorithm>
using namespace std;


int main() {
    /* Enter your code here. Read input from STDIN. Print output to STDOUT */
    return 0;
}
```

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Line: 1 Col: 1

Upload Code as File Test against custom input Run Code Submit Code