# K: Bird Watching

*Time limit: 3 seconds*



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Kiara studies an odd species of birds which travel in a very peculiar way. Their movements are best explained using the language of graphs: there exists a directed graph $\mathcal{G}$ where the nodes are trees, and a bird can only fly from a tree $T_a$ to $T_b$ when $(T_a, T_b)$ is an edge of $\mathcal{G}$.

Kiara does not know the real graph $\mathcal{G}$ governing the flight of these birds but, in her previous field study, Kiara has collected data from the journey of many birds. Using this, she has devised a graph $\mathcal{P}$ explaining how they move. Kiara has spent so much time watching them that she is confident that if a bird can fly directly from $a$ to $b$, then she has witnessed at least one such occurrence. However, it is possible that a bird flew from $a$ to $b$ to $c$ but she only witnessed the stops $a$ and $c$ and then added $(a, c)$ to $\mathcal{P}$. It is also possible that a bird flew from $a$ to $b$ to $c$ to $d$ and she only witnessed $a$ and $d$, and added $(a, d)$ to $\mathcal{P}$, etc. To sum up, she knows that $\mathcal{P}$ contains all the edges of $\mathcal{G}$ and that $\mathcal{P}$ might contain some other edges $(a, b)$ for which there is a path from $a$ to $b$ in $\mathcal{G}$ (note that $\mathcal{P}$ might not contain all such edges).

For her next field study, Kiara has decided to install her base next to a given tree $T$. To be warned of the arrival of birds on $T$, she would also like to install detectors on the trees where the birds can come from (i.e. the trees $T'$ such that there is an edge $(T', T)$ in $\mathcal{G}$). As detectors are not cheap, she only wants to install detectors on the trees $T'$ for which she is sure that $(T', T)$ belongs to $\mathcal{G}$.

Kiara is sure that an edge $(a, b)$ belongs to $\mathcal{G}$ when $(a, b)$ is an edge of $\mathcal{P}$ and all the paths in $\mathcal{P}$ starting from $a$ and ending in $b$ use the edge $(a, b)$. Kiara asks you to compute the set $\mathcal{S}(T)$ of trees $T'$ for which she is sure that $(T', T)$ is an edge of $\mathcal{G}$.

## Input

The input describes the graph $\mathcal{P}$. The first line contains three space-separated integers $N$, $M$, and $T$: $N$ is the number of nodes of $\mathcal{P}$, $M$ is the number of edges of $\mathcal{P}$ and $T$ is the node corresponding to the tree on which Kiara will install her base.

The next $M$ lines describe the edges of the graph $\mathcal{P}$. Each contains two space-separated integers $a$ and $b$ ($0 \leqslant a, b < N$ and $a \neq b$) stating that $(a, b) \in \mathcal{P}$. It is guaranteed that the same pair $(a, b)$ will not appear twice.

## Limits

- $1 \leqslant N, M \leqslant 100\,000$;
- $0 \leqslant T < N$.

### Output

Your output should describe the set $\mathcal{S}(T)$. The first line should contain an integer $L$, which is the number of nodes in $\mathcal{S}(T)$, followed by $L$ lines, each containing a different element of $\mathcal{S}(T)$. The elements of $\mathcal{S}(T)$ should be printed in increasing order, with one element per line.

### Sample Input 1

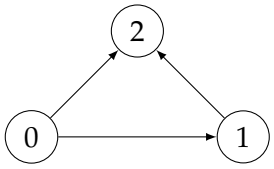
```
3 3 2
0 1
0 2
1 2
```

### Sample Output 1

```
1
1
```

### Sample Explanation 1

The graph corresponding to this example is depicted on the right. The node 1 belongs to $\mathcal{S}(2)$ because the (only) path from 1 to 2 uses $(1,2)$. The node 0 does not belong to $\mathcal{S}(2)$ because the path $0 \to 1 \to 2$ does not use the edge $(0,2)$.




### Sample Input 2

```
6 8 2
0 1
0 2
1 2
2 0
2 3
3 4
4 2
2 5
```

### Sample Output 2

```
2
1
4
```

### Sample Explanation 2

The graph corresponding to this example is depicted on the right. For the same reason as in Sample 1, the node 0 does not belong to $\mathcal{S}(2)$ while 1 does. The nodes 3 and 5 do not belong to $\mathcal{S}(2)$ because we do not have edges $(3,2)$ or $(5,2)$. Finally 4 belongs to $\mathcal{S}(2)$ because all paths from 4 to 2 use the edge $(4,2)$.

