# Problem B. Balanced Advertising

| | |
|---|---|
| Input file: | `standard input` |
| Output file: | `standard output` |
| Time limit: | 4 seconds |
| Memory limit: | 512 megabytes |

— How do you sustain a business model in which users don't pay for your service?
— Senator, we run ads.

Mark Zuckerberg's testimony.

Many IT companies make most of their profit by selling ad slots every time the user enters their website, application, etc. So is Back Catalog Inc. In this problem we are going to consider ads on a specific topic which wished to remain anonymous. What is important is that there are $n$ users looking for pages on this topic and there are $m$ websites they are interested in. Moreover, we are given a list of $k$ user-website pairs meaning that this user sometimes visits this website. There are no other visits to website except for mentioned in this list.

The topic we consider is not only specific, it is also very rare, so there are only two companies that would like to purchase some advertising. In particular, they can buy the exclusive rights to show ads to some particular user on some particular website. Obviously, none of the companies will buy rights for a non-existent user-website pair. Moreover, if a user-website pair remains unused (none of these two companies will buy it), this user will see no ads at this website at all.

The good old days of the internet are gone and nowadays there are tons of advertising rules to comply with. The first rule is that for each user, the number of websites that show him ads of the first company and the number of websites that show him ads of the second company should differ by no more than 1 (absolute difference). The second rule is that for each website, the number of users it shows ads of the first company and the number of users it shows ads of the second company should also differ by no more than 1 (absolute difference).

You are hired by the European Commission to verify the fairness of the above rules. None of the user-website pairs are acquired by advertising companies yet. Your goal is to find the maximum possible difference between the number of pairs bought by the first company and the number of pairs bought by the second company if all rules are obeyed.

## Input

The first line of the input contains three integers $n$, $m$ and $k$ ($1 \le n, m, k \le 100\,000$) — the number of users, the number of websites and the number of user-website pairs for ad sales.

Then follow $k$ lines. The $i$-th of these lines contains two integers $u_i$ and $v_i$ ($1 \le u_i \le n$, $1 \le v_i \le m$), meaning that user $u_i$ visits website $v_i$. No pair appears in the input more than once.

## Output

In the first line of the input print two integers $a$ and $b$ ($0 \le b \le a \le k$), the number of user-website pairs that the first company should buy and the number of user-website pairs that the second company should buy in the most unfair scenario, i.e. in the case that maximizes $a - b$.

The second line should contain $a$ distinct integers from 1 to $k$ — indices of the pairs that the first company should buy.

The third line should contain $b$ distinct integers from 1 to $k$ — indices of the pairs that the second company should buy. Of course, none of these integers should appear in the second line that defines pairs for the first company.

If either of the subsets is empty just leave the corresponding line blank.

In each of the second and third lines it is allowed to print indices in arbitrary order. If there are several possible answers, you are allowed to print any of them.

## Examples

| standard input | standard output |
|---|---|
| 3 4 4<br>1 1<br>2 2<br>3 3<br>3 4 | 3 0<br>1 2 3 |
| 3 3 9<br>1 1<br>1 2<br>1 3<br>2 1<br>2 2<br>2 3<br>3 1<br>3 2<br>3 3 | 6 3<br>1 8 9 3 4 5<br>2 7 6 |