# Task: APD
# All Paws on Deck

AACPP SuSe 2025 Round 9 Memory: 128MiB 2025.07.15 – 2025.07.22

The neighbourhood cats are in grave peril! The evil trust fund that owns all the houses in the neighbourhood hates everything that is nice and they want to get rid of all the cats on their property! They asked a local official to take a tour around the buildings and see all the chaos and mischief the cats are causing every day.

While Dexter has not enough power to launch a full socialist revolution and destroy the very concept of land ownership itself, he can try to organise the $n$ cats and force them to behave during the inspection. That will make the landlords *fur*ious! It will take a truly egregious amount of snacks and treats to convince enough cats, but thanks to your previous help Dexter is quite well-off – pawker and kickbacks from his subordinates in the Meowfia ensure he always has access to more treats than he can eat.

Unfortunately, while the cats can be convinced to work towards the common good, some animosities between them just cannot be overcome. Dexter is aware that some cats just *cannot* stand the presence of other cats, and if a pair of cats that despise each other is part of the squad they will surely fight and cause a ruckus – then the evil landlords will have their way! Dexter must thus exclude some of the cats and tell them to hunt rats in different basements around the neighbourhood. However, he needs the vast majority of them, at least $k$, so that the inspector clearly sees that they are a vital, fluffy part of the neighbourhood and getting rid of them would be unacceptable.

It is meow or never – help Dexter save the neighbourhood! You need to answer the following question – can he assemble a squad of at least $k$ cats such that there are no animosities between any of them? If yes, which cats should he choose?

## Input

The first line of input contains two integers $n$ and $k$, which specify the number of cats in the neighbourhood and the number of cats required for the operation. The cats are numbered from $1$ to $n$.

The second line contains the single integer $m$, the number of animosities between pairs of cats. Then $m$ lines follow. The $i$-th of these lines contains two integers $a_i$ and $b_i$, which indicate that the cat $a_i$ does not like cat $b_i$ ($1 \leq a_i, b_i \leq n$, $a_i \neq b_i$).

## Output

If it is not possible to assemble a squad of at least $k$ cats, the only line of the output should contain a single word: `CATASTROPHE`.

If it is possible, the first line of output should contain the integer $l$, the maximum number of cats that Dexter can put in the squad. In the second line, print $l$ integers – the numbers of cats Dexter should use – **in ascending order**. If there is more than one possible solution your program can output any of them.

## Example

For the input:

```
9 4
12
9 6
4 6
7 9
1 2
2 1
9 7
7 6
4 5
7 8
8 9
3 4
4 3
```

the correct output is:

```
5
1 3 5 6 8
```

### Additional examples

The following initial tests are also available:

- `0b` – $n = 10$, $m = 18$, $k = 9$, cat $1$ hates everyone else and everyone hates $1$.
- `0c` – $n = 120$, $m = 119$, $k = 110$, cat $i$ hates cat $i + 1$ for $1 \leq i < n$; answer is `CATASTROPHE`.
- `0d` – $n = 1\,000\,000$, $m = 2\,999\,997$, $k = 999\,990$, cat $i$ hates cat $i + 1$, everyone hates $1$ and $n$.
- `0e` – $n = 200\,000$, $m = 2\,999\,985$, $k = 199\,985$, cats $1$ through $15$ hate every other cat.

## Limits

Your solution will be evaluated on a number of hidden test cases divided into groups. Points for a group are awarded if and only if the submission returns the correct answer for each of the tests in the group within the allotted time limit. These groups are organised into subtasks with the following limits and points awarded.

### Partial points

If your solution outputs the optimal cost (first line of output), and the second line is left blank or not correct, it will receive $50\%$ of the points for a given test group.

| Subtask | Limits | Points |
|---|---|---|
| 1. | $2 \leq n \leq 60$, $1 \leq m \leq 40$, $n - 10 \leq k \leq n$ | $2$ |
| 2. | $2 \leq n \leq 120$, $1 \leq m \leq 400$, $n - 10 \leq k \leq n$ | $1$ |
| 3. | $2 \leq n \leq 1\,000\,000$, $1 \leq m \leq 3\,000\,000$, $n - 15 \leq k \leq n$ | $7$ |