

# Graph

SEASON 8 – SECOND ROUND



We are given an undirected connected graph with **N** vertices and **M** edges.

A **subgraph** is defined as a pair of a subset of vertices and a subset of edges, such that the endpoints of all edges in the subset are in the subset of vertices.

We want to check if there exists a subgraph of the given graph that satisfies the following conditions:

- 1) It is **biconnected**. This means that if we erase any **vertex or edges**, the subgraph will remain connected.
- 2) It is **bipartite**. This means that it is possible to color the vertices in two colors so that the endpoints of the edges have different colours.
- 3) The number of vertices in this subgraph is greater than or equal to 3.

Write a program that checks whether such a subgraph exists. If so, you should also find an example of such a subgraph.

## Input

The first line of the input file `graph.in` contain **N** and **M** – the number of vertices and the number of edges of the given graph.

The **i**-th of the next **M** lines contains **u[i]** and **v[i]** – the information about the **i**-th edge of the graph. This means that there is a undirected edge between vertices **u[i]** and **v[i]**.

It is guaranteed that the given graph is connected and it has no loops (**u[i] ≠ v[i]**). Also it is guaranteed that there is at most one edge between every pair of vertices in the graph.

## Output

On the first line of the output file `graph.out` отпечатайте един ред с print „**Yes**“ if there exists a subgraph that satisfies the above-mentioned conditions. Otherwise print „**No**“.

If such a subgraph exists, on the second line print the numbers **P** and **K** – the number of vertices and edges in the subgraph respectively. On the **i**-th of next **K** lines print the **a[i]** и **b[i]** – the endpoints of the **i**-th edge in the subgraph. If there are multiple correct answers, you can print any.

## Constraints

$$2 \leq N \leq 10^5$$

$$1 \leq M \leq 2 * 10^5$$

**Time limit: 1 sec**

**Memory limit: 256 MB**

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## Examples

Input (graph.in)	Output (graph.out)
4 5 1 2 2 3 3 4 1 3 2 4	Yes 4 4 1 2 3 4 1 2 1 3 2 4 3 4
3 3 1 2 2 3 3 1	No