# Bridges of Königsberg

HackerRank

Let $G = (V, E)$ be a connected, undirected graph. A bridge of $G$ is and edge $(u, v)$ such that $G' = (V, E - \{(u, v)\})$ is disconnected. In other words, removal of edge $(u, v)$ disconnects the graph.

Write an efficient algorithm to compute all the bridges in a graph.

### Input Format

The first line of each test will be two space separated positive integers $|V|$ and $|E|$ denoting number of vertices and number of edges in input graph $G$ respectively. Let the vertices of graph $G$ be labelled with $\{0, \ldots, |V| - 1\}$

Each of the following $|E|$ lines will contain two space separated positive integers $u$ and $v$ denoting an edge between vertix $u$ and $v$.

### Constraints

- $1 \leq |V| \leq 10^5$.
- $1 \leq |E| \leq 10^{10}$

### Output Format

For the input graph $G = (V, E)$, let $\mathrm{E}^{\mathrm{B}} = \{(a_1, b_1), \ldots, (a_p, b_p)\}$ be the set of bridges such that for all $i$, $a_i \leq b_i$. Print each edges in $\mathrm{E}^{\mathrm{B}}$ on a new line such that $(a_k, b_k)$ is printed before $(a_\ell, b_\ell)$ if and only if -

- $a_k \leq a_\ell$
- $b_k \leq b_\ell$

If $\mathrm{E}^{\mathrm{B}}$ is an empty set, then print "No" (without quotes, case sensitives).

### Sample Input 0

```
12 14
0 1
6 7
2 4
5 6
1 2
2 3
7 4
3 0
4 5
6 10
8 9
9 10
10 11
11 8
```

### Sample Output 0

```
2 4
6 10
```