DFS Directed Graph

Given a directed graph, print the order of visiting vertex using Deep-First Search algorithm from vertex 0 and smallest vertex is prioritized than other vertices.

Input

The first line consists of two positive integers, the number n vertices $(0<n<10^5)$ and the number of edges m $(0<m<2 \times 10^5)$.

Then there are m lines, each containing two integers u and v representing an edge from u to v. $(u,v<10^5)$.

Output

Print the list of vertex separated by spaces.

Example

Input:
4 4
0 3
3 2
1 0
0 1

Output:
0 1 3 2