

BFS Directed Graph

Given a directed graph, print all vertices of the tree. When there is more than one vertex connect to visiting vertices, prioritize to visit the smaller nodes first.

Input

The first line consists of two positive integers, the number of vertices n ($0 < n < 105$) and the number of edges m ($0 < m < 2 \times 105$).

Then there are m lines, each containing two integers u and v ($u, v < 105$), representing an edge from u to v .

Output

The list of vertices in the required order, separated by spaces.

Example

Input:

4 4

0 3

3 2

1 0

0 1

Output:

0 1 3 2