

AADL (Assignment 2)

Sink problems & Topological sort

Problem-1: Number of sink nodes in a graph

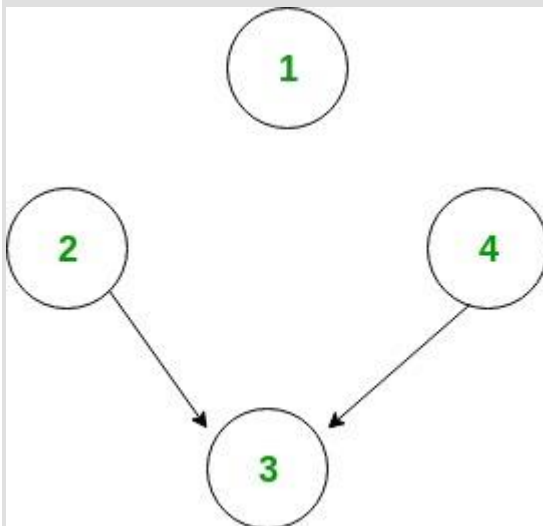
Given a Directed Acyclic Graph of n nodes (numbered from 1 to n) and m edges. The task is to find the number of sink nodes. A sink node is a node such that no edge emerges out of it.

Examples:

Input : $n = 4, m = 2$

Edges[] = {{2, 3}, {4, 3}}

Output : 2



Only node 1 and node 3 are sink nodes.

Input : $n = 4, m = 2$

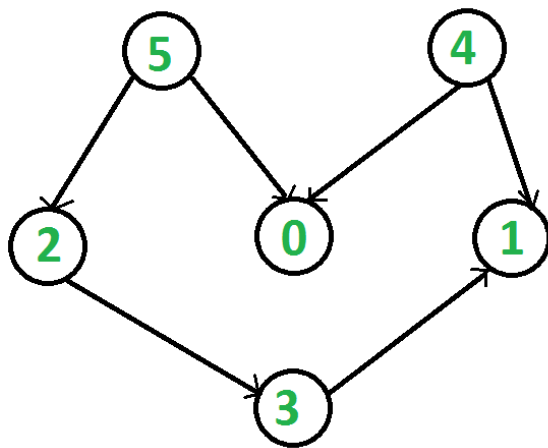
Edges[] = {{3, 2}, {3, 4}}

Output : 3

Problem-2: Topological Sorting

Topological sorting for Directed Acyclic Graph (DAG) is a linear ordering of vertices such that for every directed edge uv , vertex u comes before v in the ordering. Topological Sorting for a graph is not possible if the graph is not a DAG.

For example, a topological sorting of the following graph is “5 4 2 3 1 0”. There can be more than one topological sorting for a graph. For example, another topological sorting of the following graph is “4 5 2 3 1 0”. The first vertex in topological sorting is always a vertex with in-degree as 0 (a vertex with no incoming edges).



Assignment Details

- 1- Type of work: team of two students.
- 2- Duration: 1 week
- 3- Grade: 5 marks.

Best Regards
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