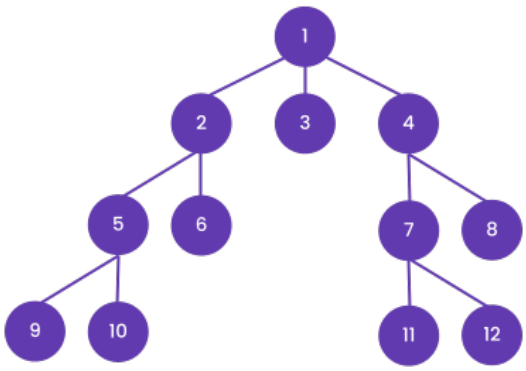
Graphs-2

Assignment Questions

PW SKILLS

Q1. Detect the cycle in a graph using DFS only. If Cycle is present in the following graph.



Output:

```
The graph contains a cycle
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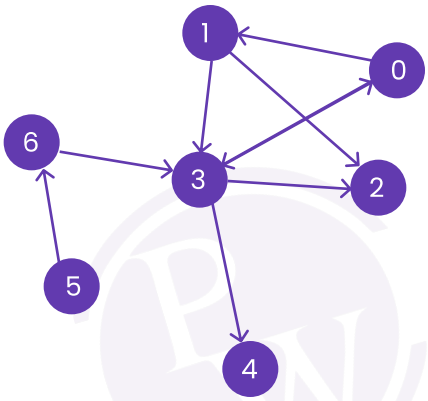
Q2. Given a directed graph, check if it is a DAG (Directed Acyclic Graph) or not. A DAG is a digraph (directed graph) that contains no cycles.
The following graph contains a cycle 0—1—3—0, so it's not DAG. If we remove edge 3–0 from it, it will become a DAG.



Output:

```
The graph is not a DAG
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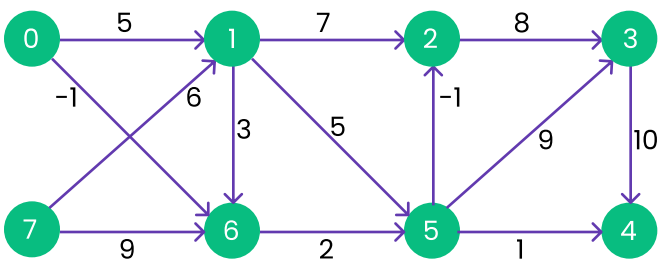
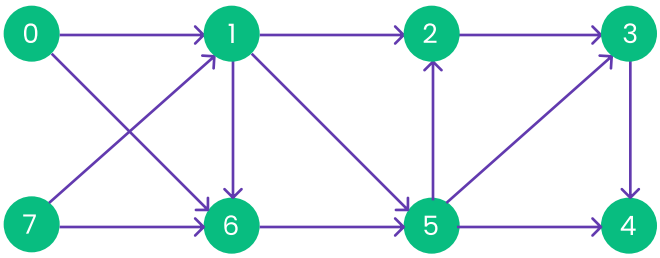
Q3. Given a weighted digraph (directed graph), find the least-cost path from a given source to a given destination with exactly m edges.
For example, consider the following graph,



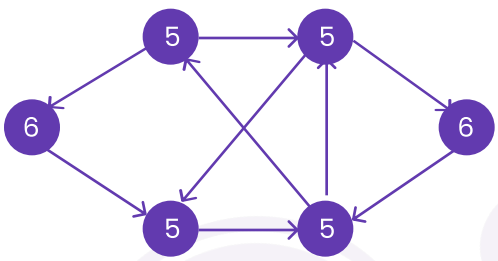
Input Src=0, dest =3, edges(m) = 4
Output: 8

Q4. Given a digraph (directed graph), find the total number of routes to reach the destination from a given source with exactly m edges.
For example, consider the following graph:



Let source = 0, destination = 3, number of edges m = 4. The graph has 3 routes from source 0 to destination 3 with 4 edges. The solution should return the total number of routes 3.

Q5. Given a directed graph, check whether it has an Eulerian path or not. An Eulerian path (or Eulerian trail) is a path in a graph that visits every edge exactly once.
The following graph has an Eulerian path since it is possible to construct a path that visits each edge exactly once. The Eulerian path is 0 —› 1 —› 2 —› 3 —› 0 —› 5 —› 4 —› 3 —› 1 —› 4.



Output:

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The graph has an Eulerian path
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