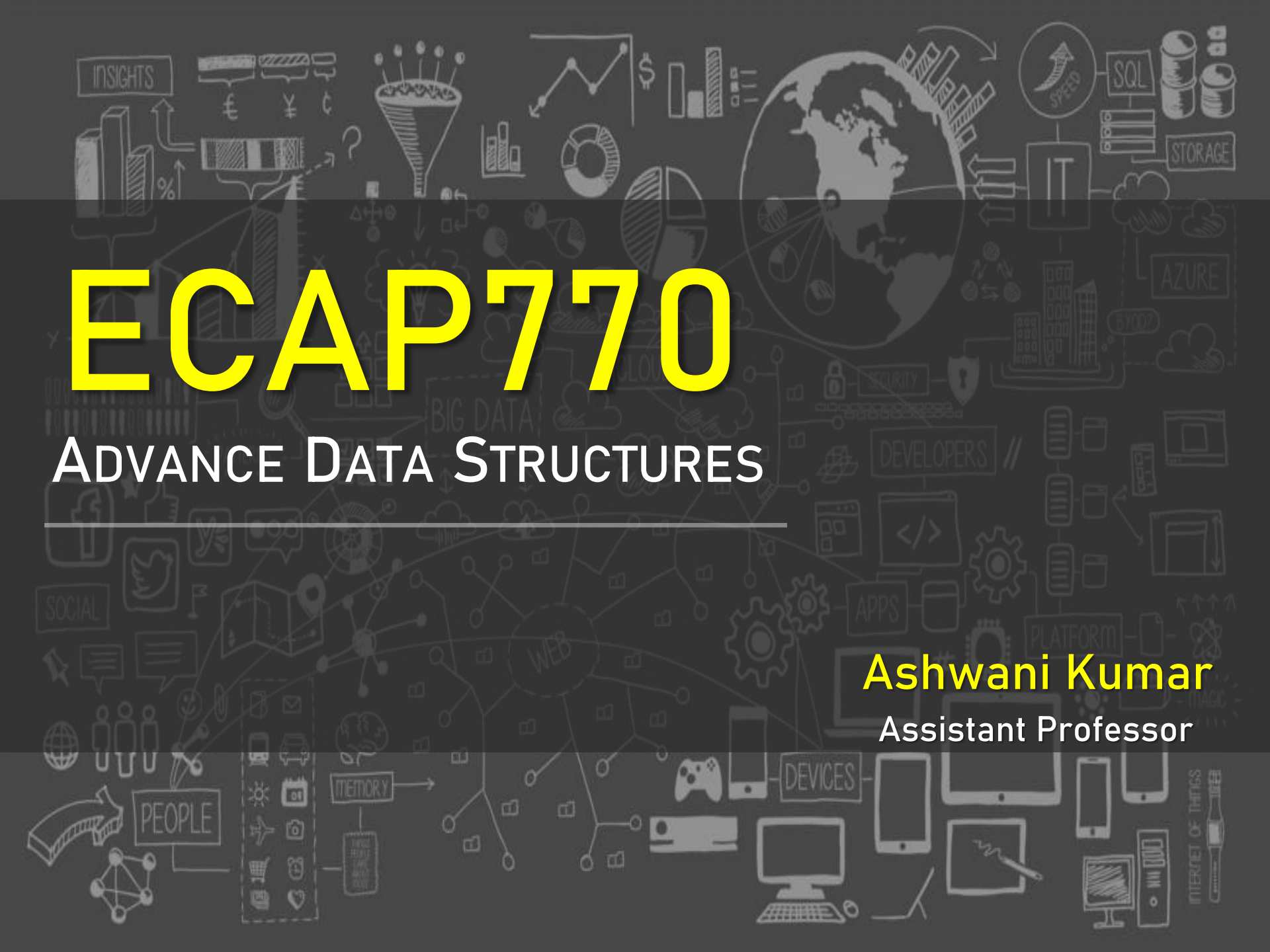

ECAP770

Advance Data Structures

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Assistant Professor

Learning Outcomes

After this lecture, you will be able to

- Understand topological sort

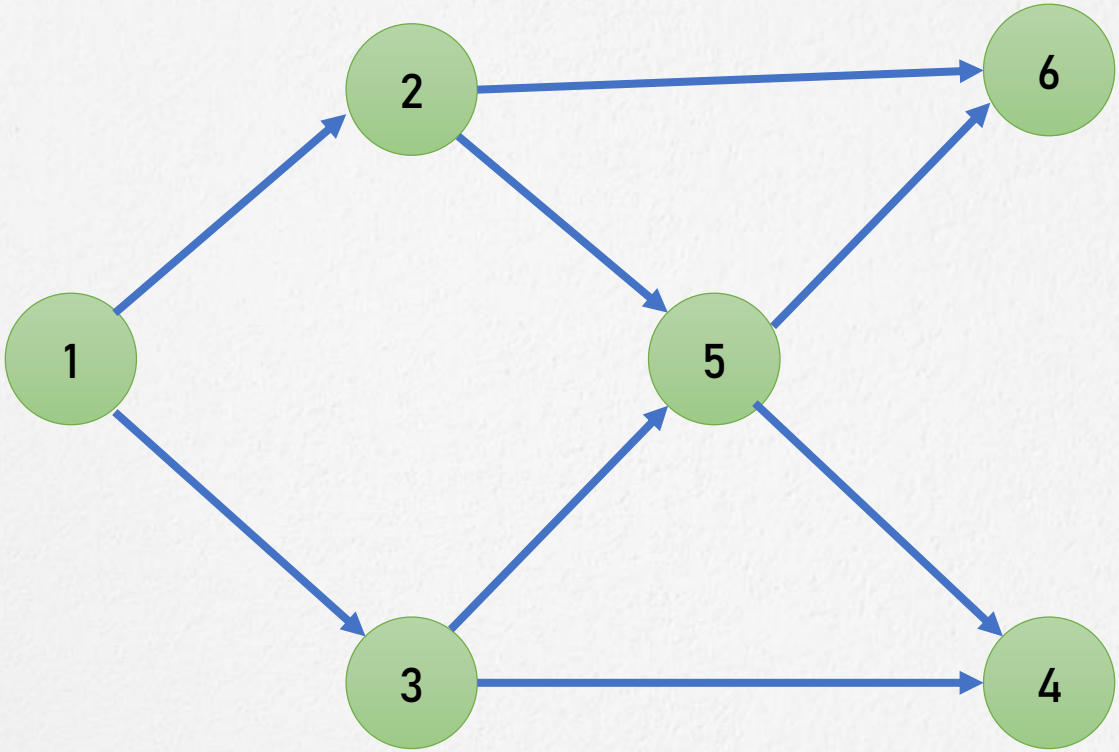
Topological sort

- Topological Sort is a linear ordering of the vertices in such a way that if there is an edge in the DAG (directed acyclic graph) going from vertex ‘u’ to vertex ‘v’, then ‘u’ comes before ‘v’ in the ordering.

Topological sort

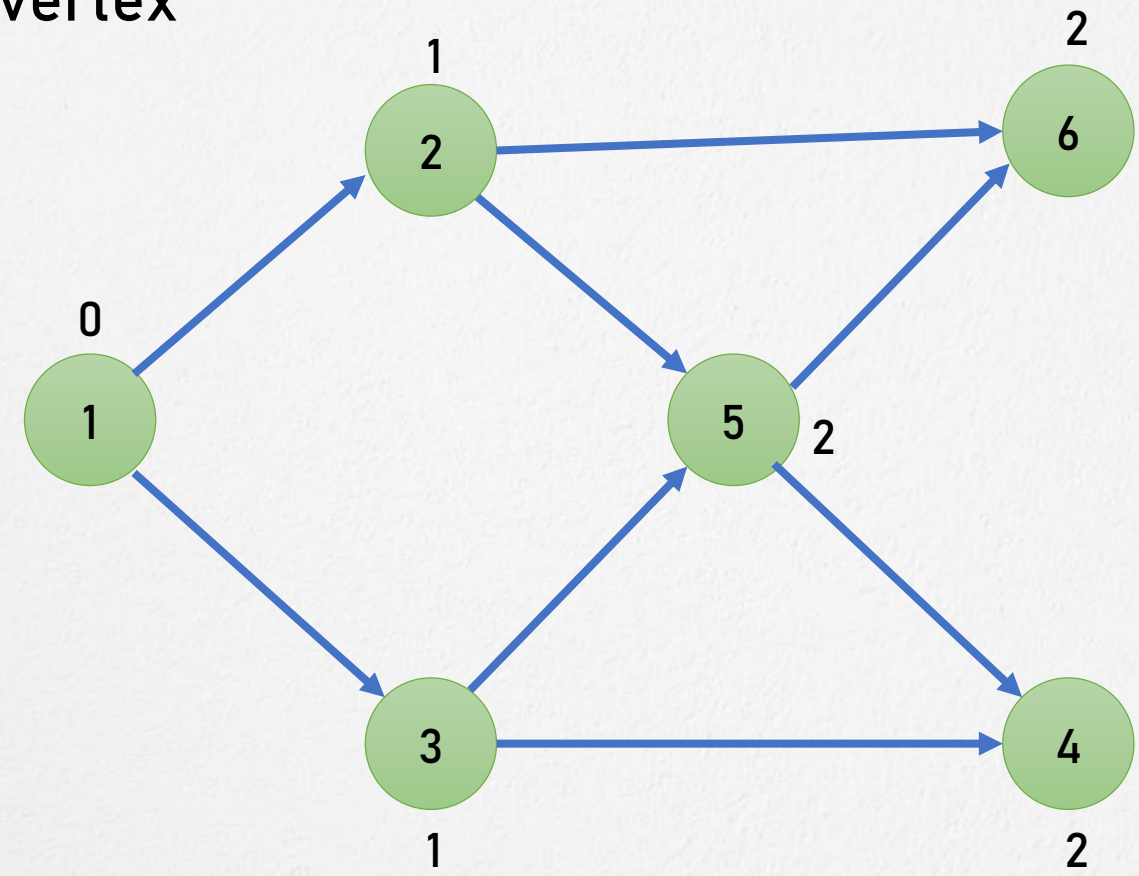
- Topological Sorting is possible if and only if the graph is a Directed Acyclic Graph.
- There may exist multiple different topological orderings for a given directed acyclic graph.

Topological sort

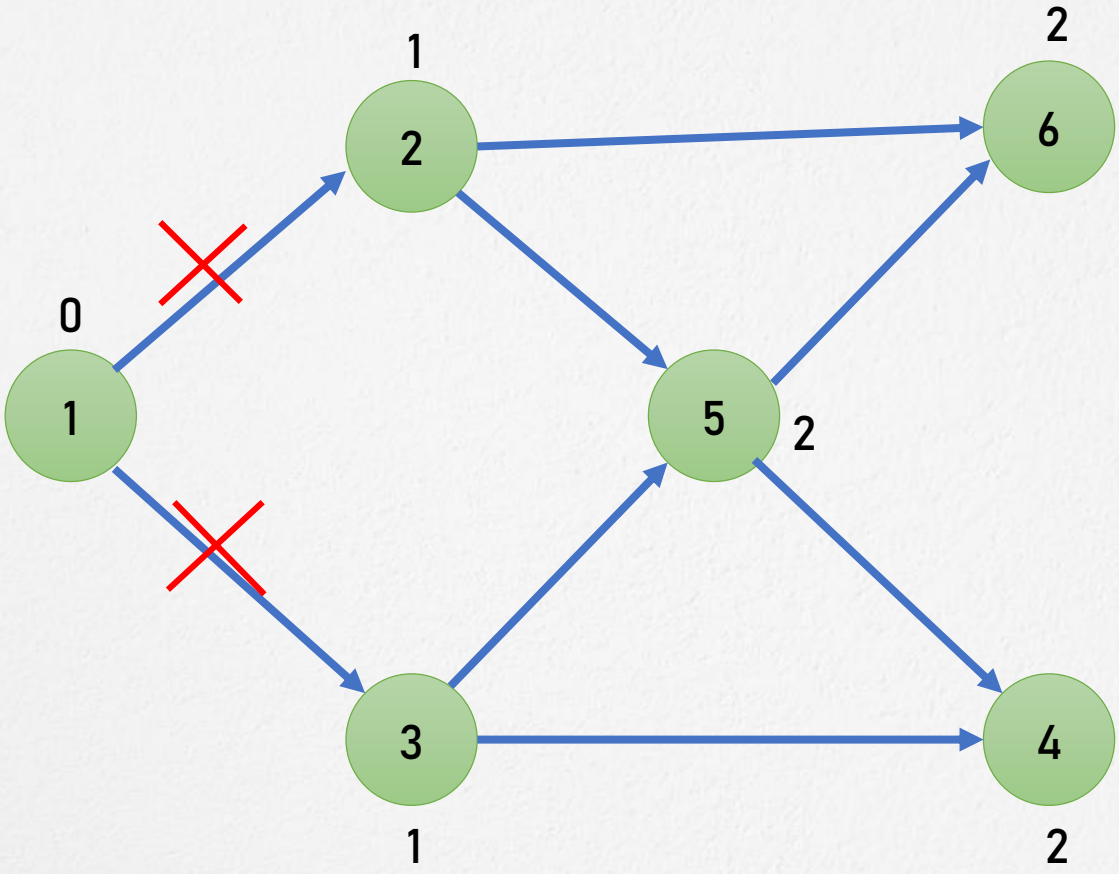


Topological sort

In-degree of vertex

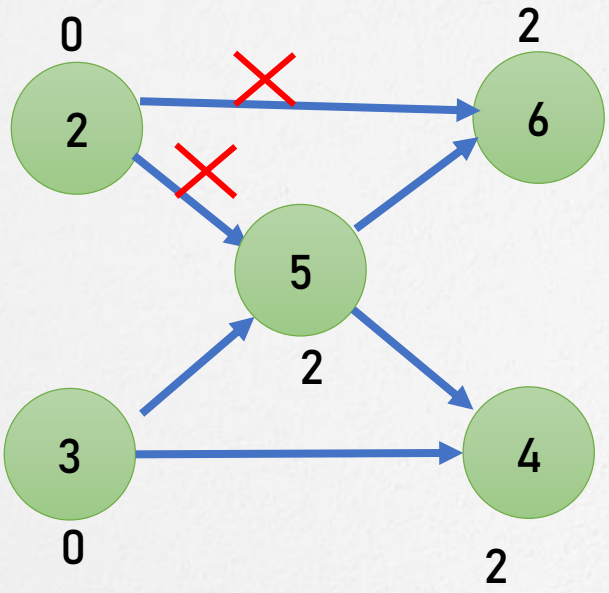


Topological sort

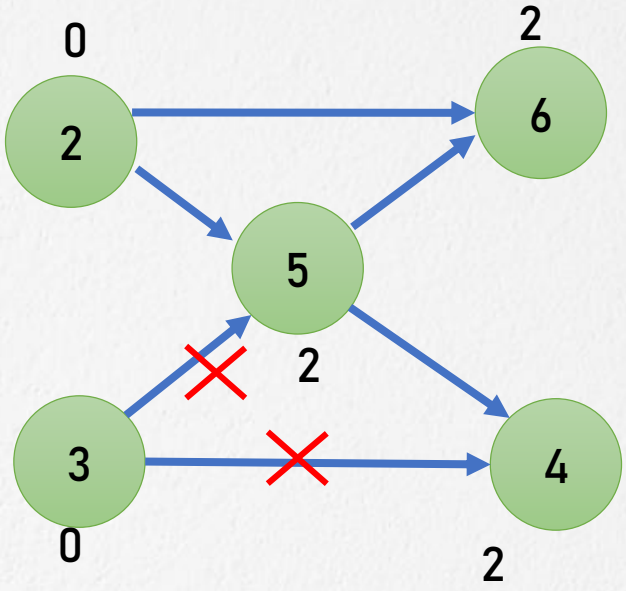


Visited vertex: 1

Topological sort

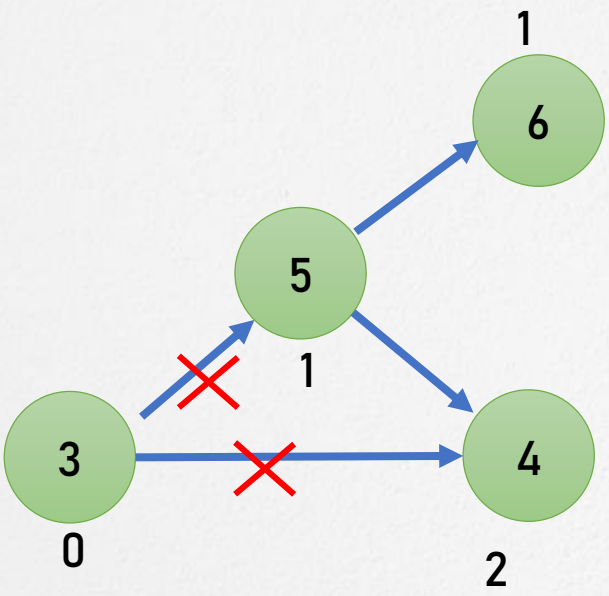


Visited vertex: 1 2

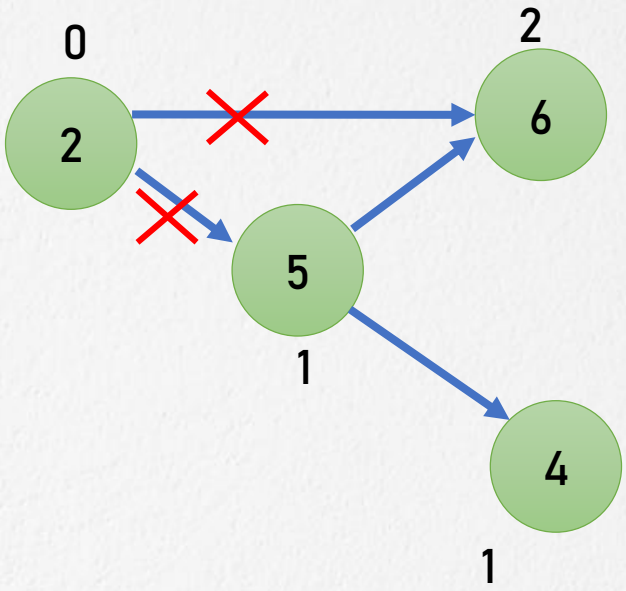


Visited vertex: 1 3

Topological sort

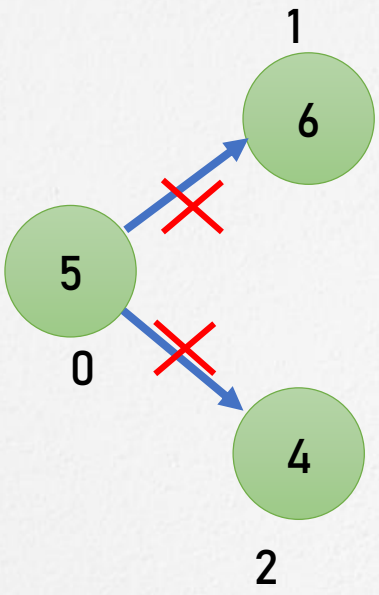


Visited vertex: 1 2 3

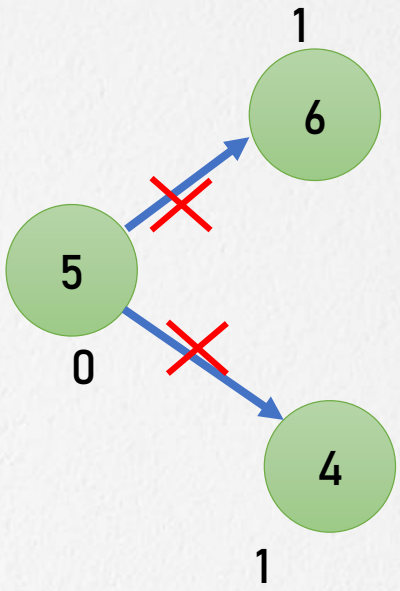


Visited vertex: 1 3 2

Topological sort



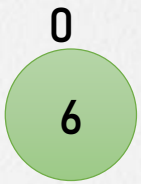
Visited vertex: 1 2 3 5



Visited vertex: 1 3 2 5

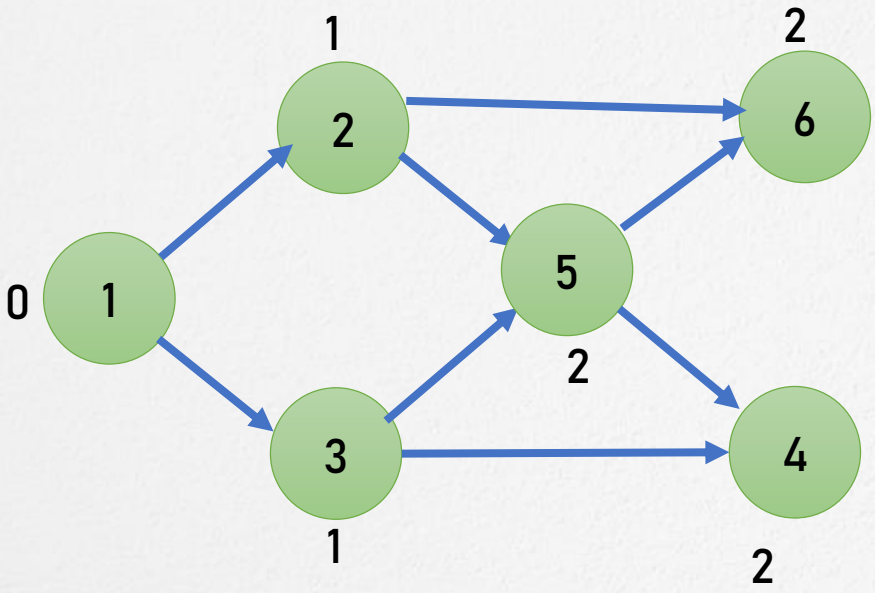
Topological sort

Visited vertex: 1 2 3 5 6 4



Visited vertex: 1 3 2 5 4 6

Topological sort



Visited vertex: 1 2 3 5 6 4

Visited vertex: 1 3 2 5 4 6

Visited vertex: 1 2 3 5 4 6

Visited vertex: 1 3 2 5 6 4

Applications of Topological Sort

- Instruction Scheduling
- Determining the order of compilation tasks to perform in make files
- Scheduling jobs from the given dependencies among jobs
- Data Serialization

That's all for now...