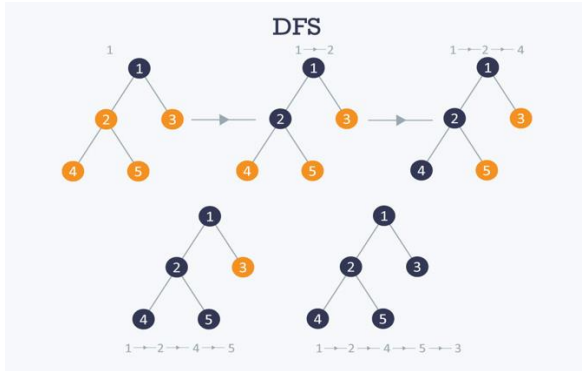


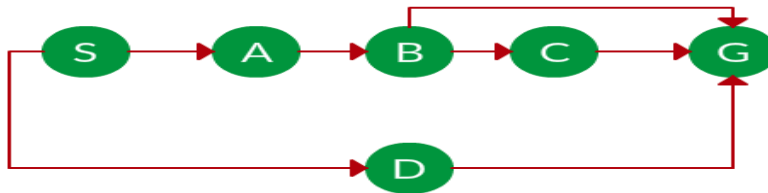
**Lecture 3 Continued...**

Another example

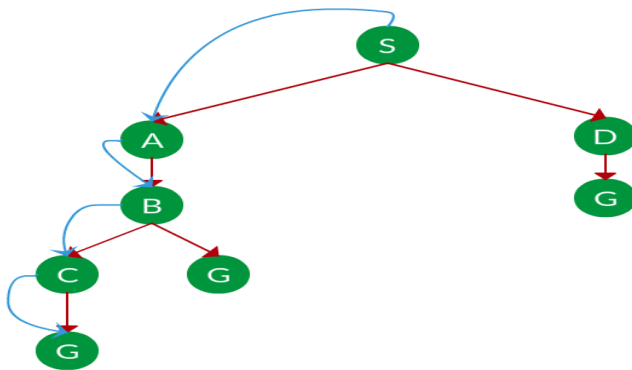


Example

- Which solution would DFS find to move from node S to node G if run on the graph below?



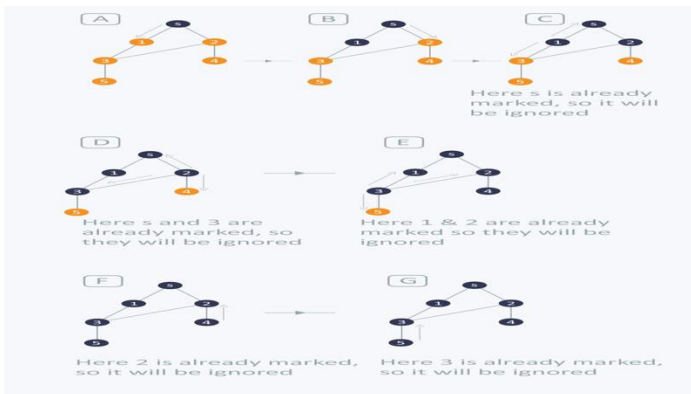
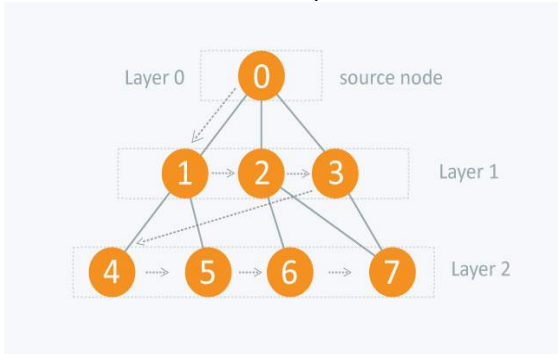
Solution



**Breadth First Search (BFS)**

- There are many ways to traverse graphs. BFS is the most commonly used approach.
- BFS is a traversing algorithm where you should start traversing from a selected node (source or starting node) and traverse the graph layer wise thus exploring the neighbor nodes (nodes which are directly connected to source node).

- You must then move towards the next-level neighbor nodes.
- As the name BFS suggests, you are required to traverse the graph breadthwise as follows:
  - First move horizontally and visit all the nodes of the current layer
  - Move to the next layer



### Uniform Cost Search

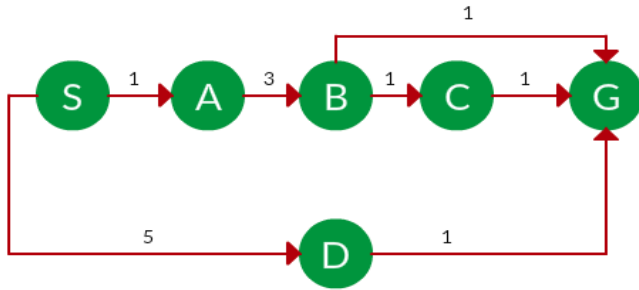
- UCS is different from BFS and DFS because here the costs come into play. In other words, traversing via different edges might not have the same cost.
- The goal is to find a path where the cumulative sum of costs is least.

**Cost of a node** is defined as:

- $\text{cost}(\text{node}) = \text{cumulative cost of all nodes from root}$
- $\text{cost}(\text{root}) = 0$

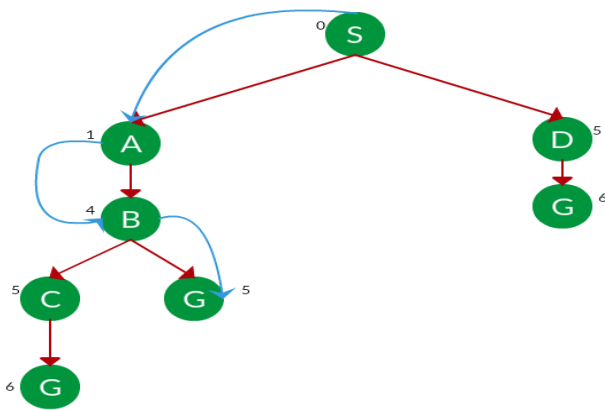
### Example

- Which solution would UCS find to move from node S to node G if run on the graph below?



Solution

- The equivalent search tree for the above graph is as follows.
- Based on UCS strategy, the path with least cumulative cost is chosen..



**Path:** S -> A -> B -> G  
**Cost:** 4