

Graph Traversal and Topological Sort

- BFS
- DFS
- Topological Sort

Breadth-First Search on Graphs

The purposes of **breadth-first search** are

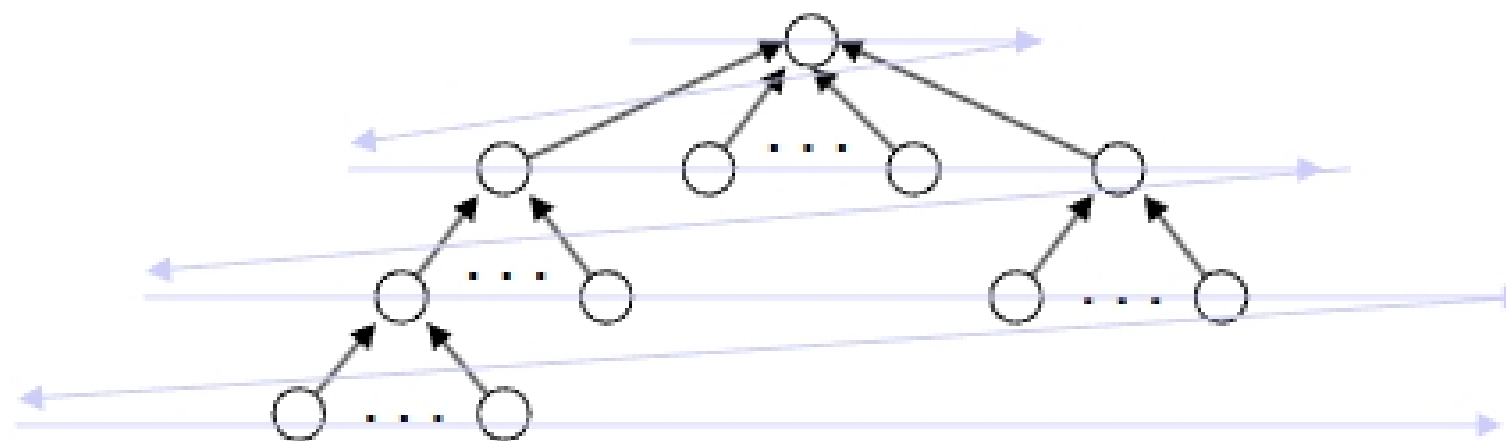
- traversing all nodes in the graph
- calculating the minimum hop path from the source node to all other nodes

The idea of the algorithm is to

- start from a chosen node
- construct a tree (**BFS Tree**)
- traverse the tree in a breadth-first manner

Data Structures for Breadth-First Search

- Use adjacency lists to represent the graph
- The vertex u of a graph consists of fields
 - $u.d$: distance to the source vertex
 - $u.color$: {white, gray, black}
 - $u.\pi$: pointer to u 's parent vertex
- Use a FIFO queue to store vertices under processing (gray)



A breadth-first search tree is constructed by the algorithm