CSCI 241

Scott Wehrwein

Graph Traversals:
Breadth-First Search

Goals

Be able to execute and implement breadth-first search to search or traverse a graph.

Depth-first Search

```
/** Visit all nodes explorable from u.
  * Pre: u is unvisited. */
public static void dfs(int nodeID) {
  Stack s = (nodeID); // Not Java!
  // inv: all nodes to be visited are
  //      explorable from some node in s
  while (s is not empty) {
    u = s.pop();
    if (u has not been visited) {
      visit u;
      for each edge (u, v) from u:
        s.push(v);
    }
  }
}
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Time for a magic trick…

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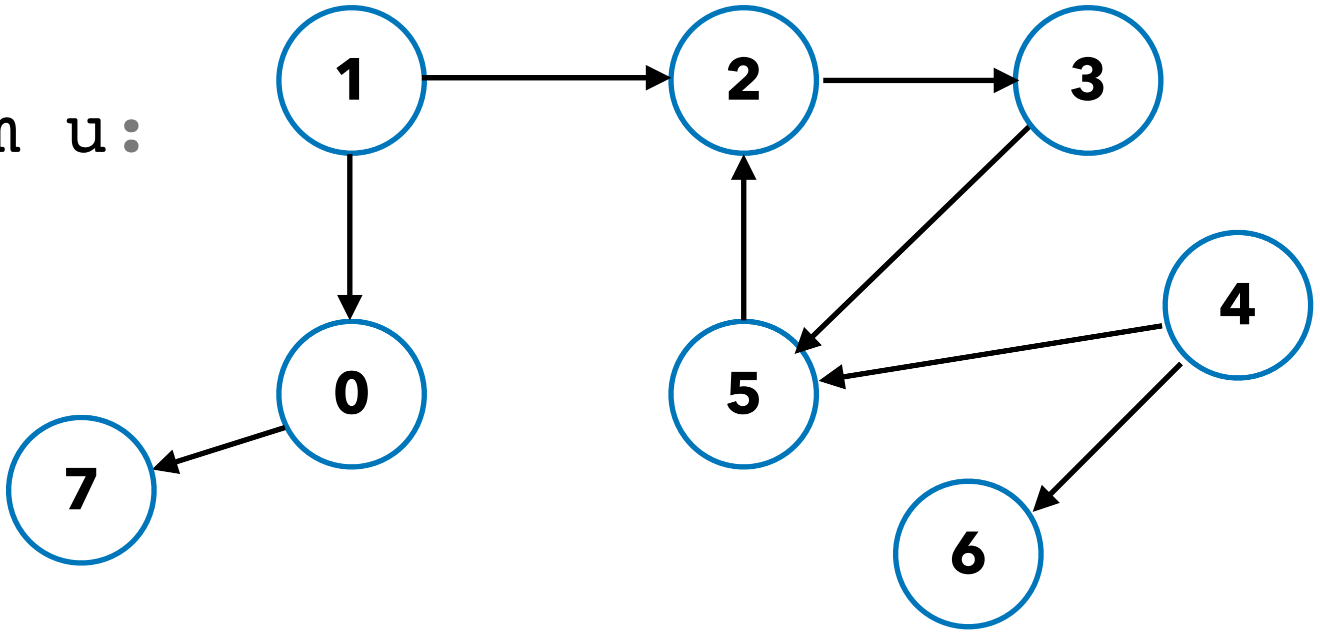
Queue q:

1

bfs(1)



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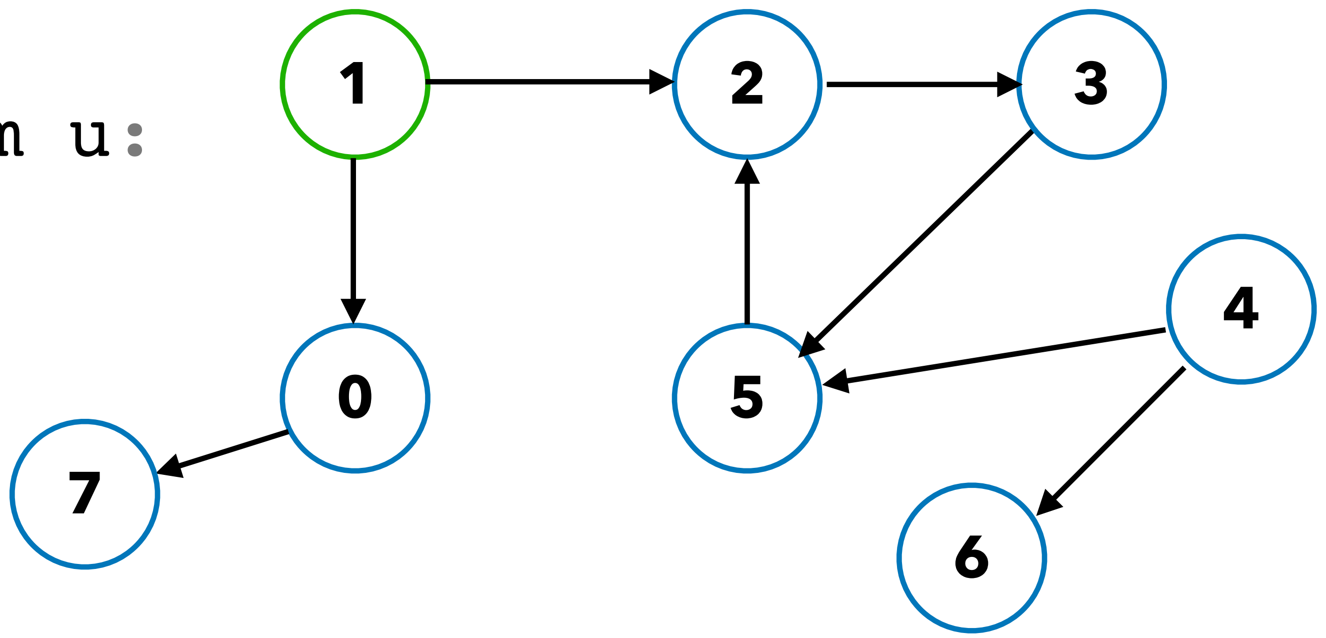
0 2

bfs(1)



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2 7
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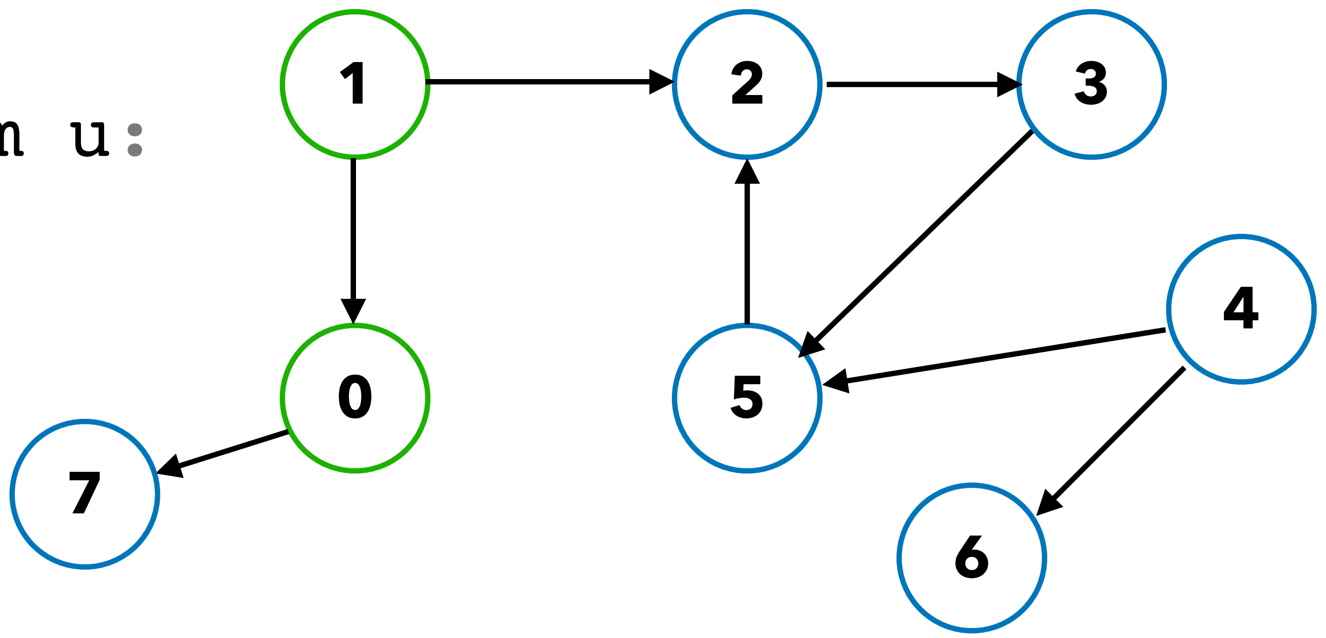
bfs(1)



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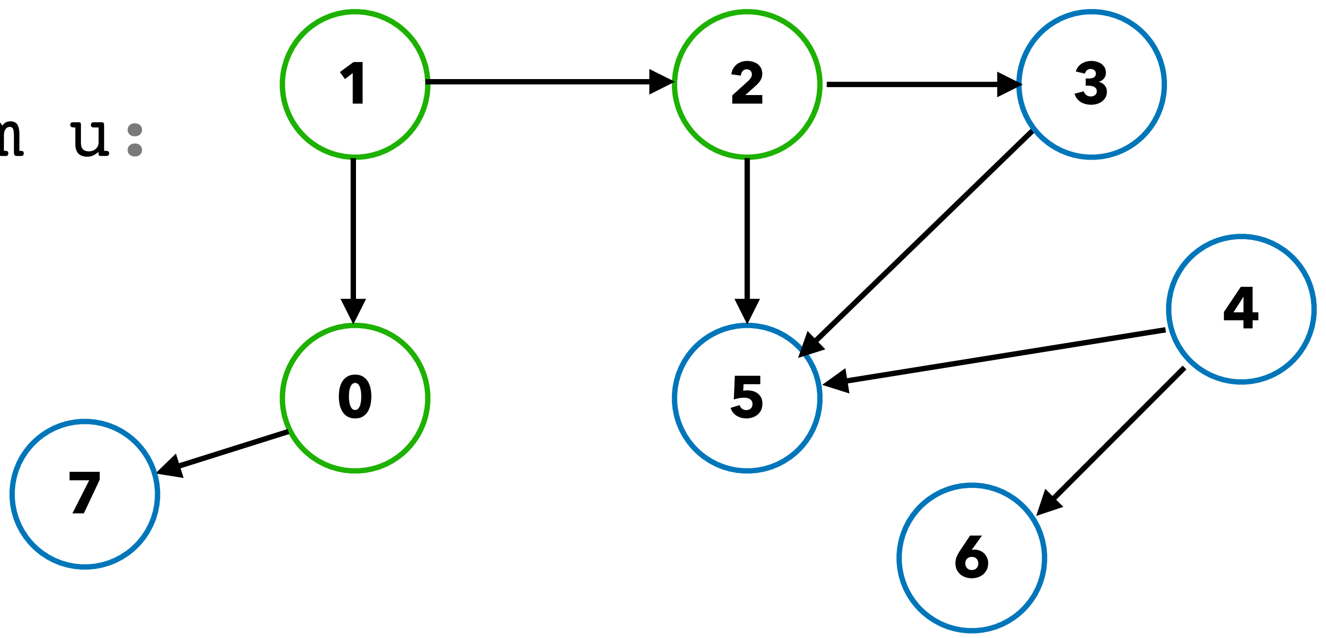
Queue q:

7	3	5

bfs(1)



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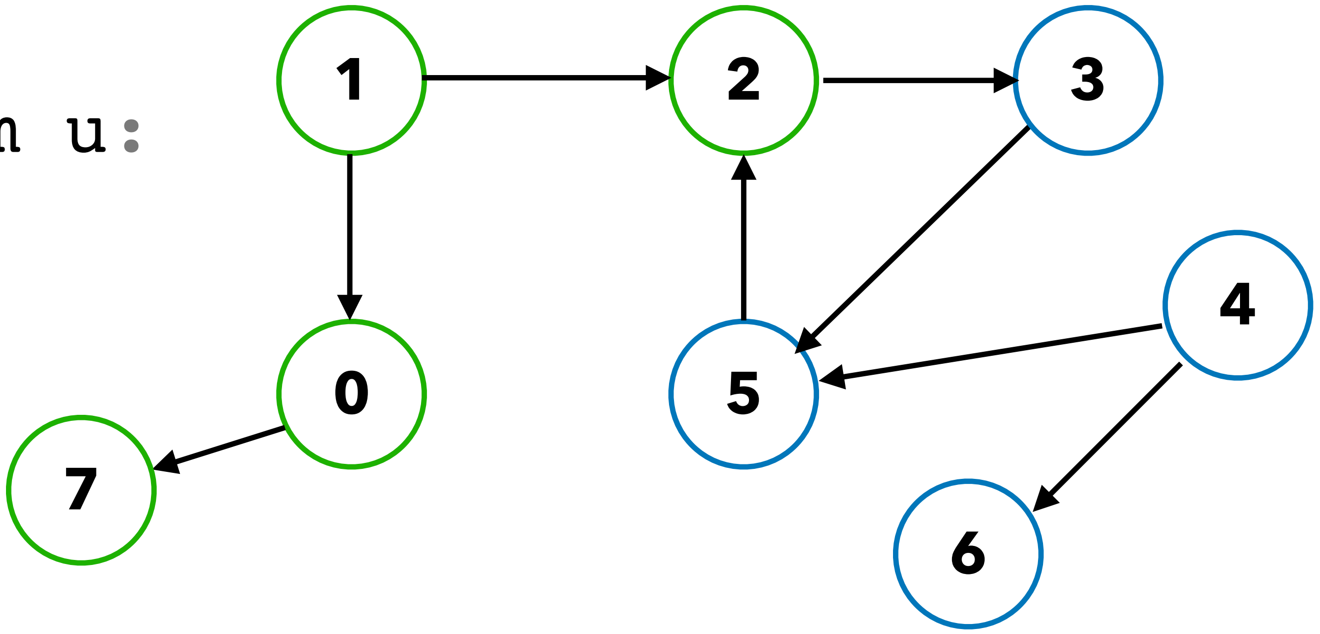

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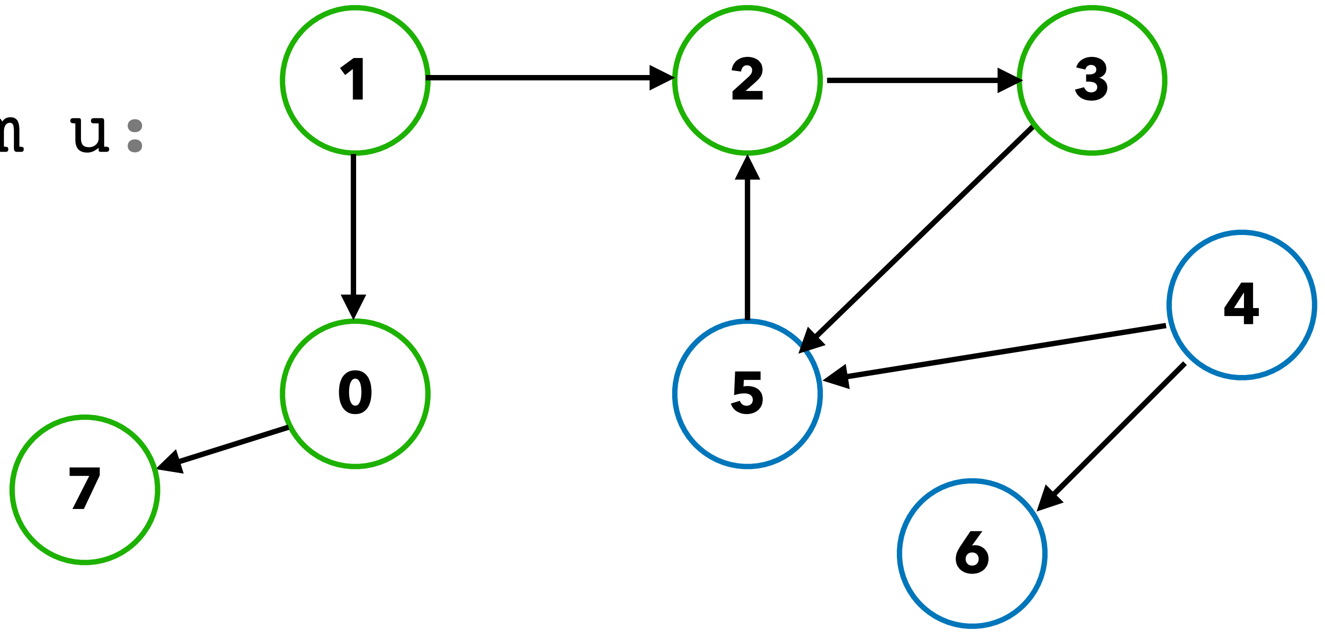
bfs(1)



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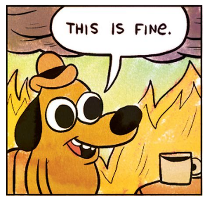
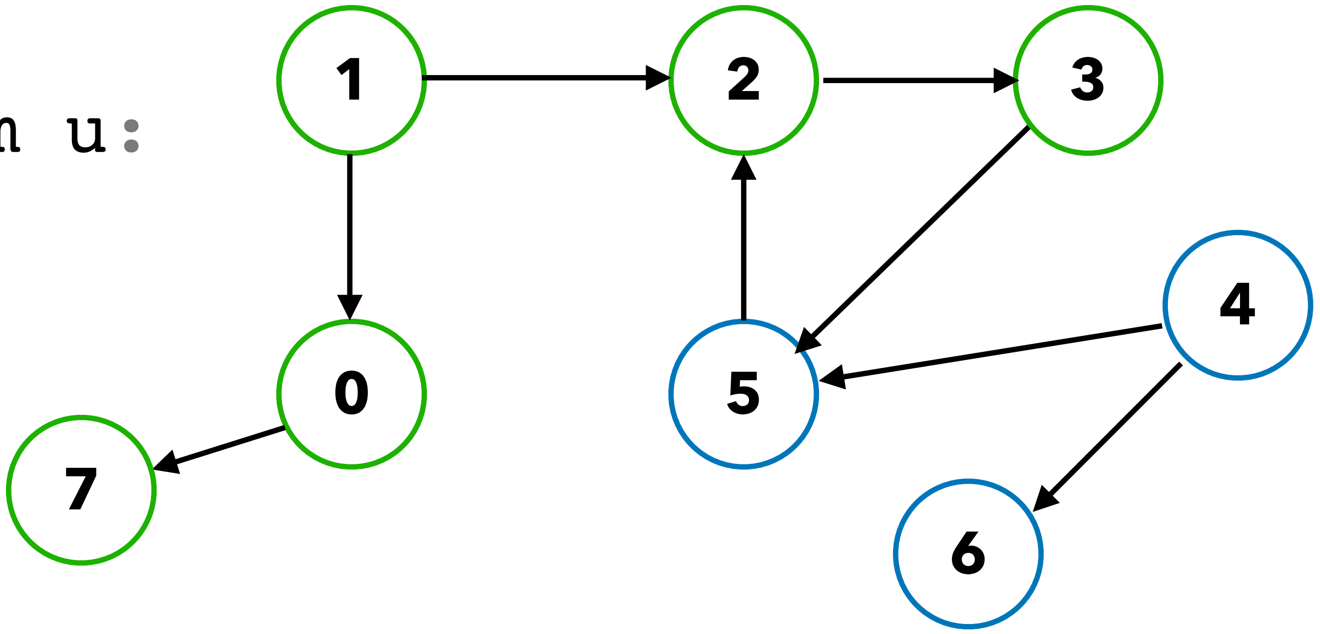


bfs(1)



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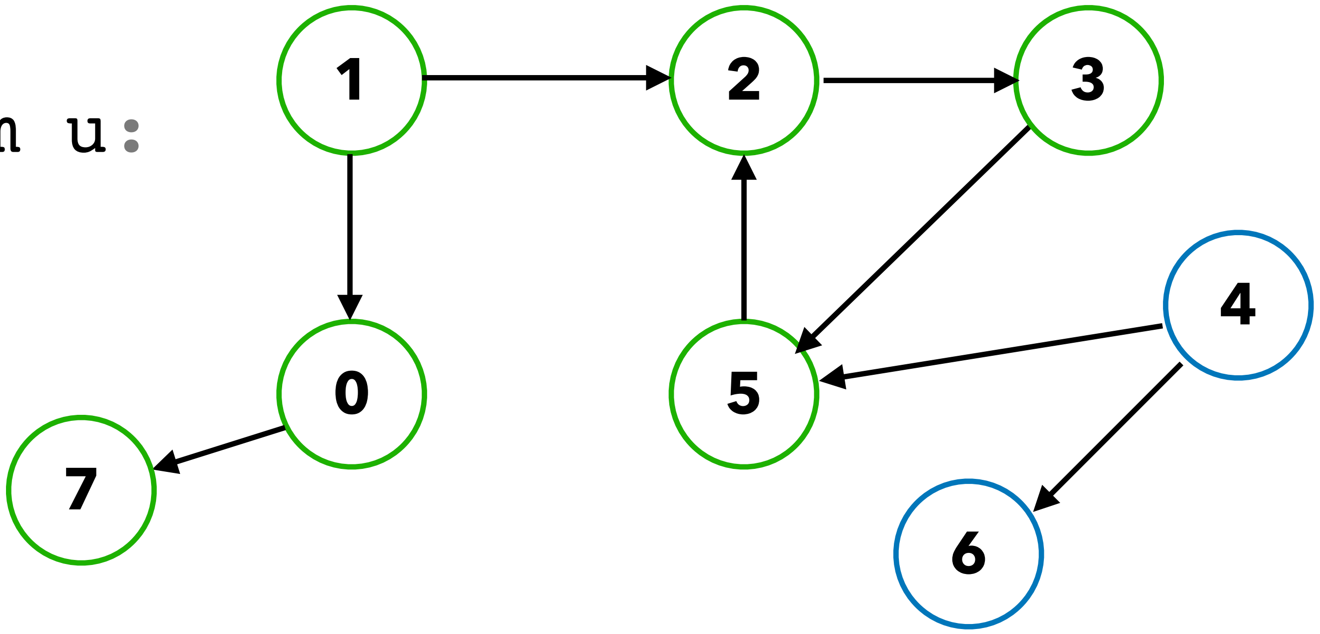

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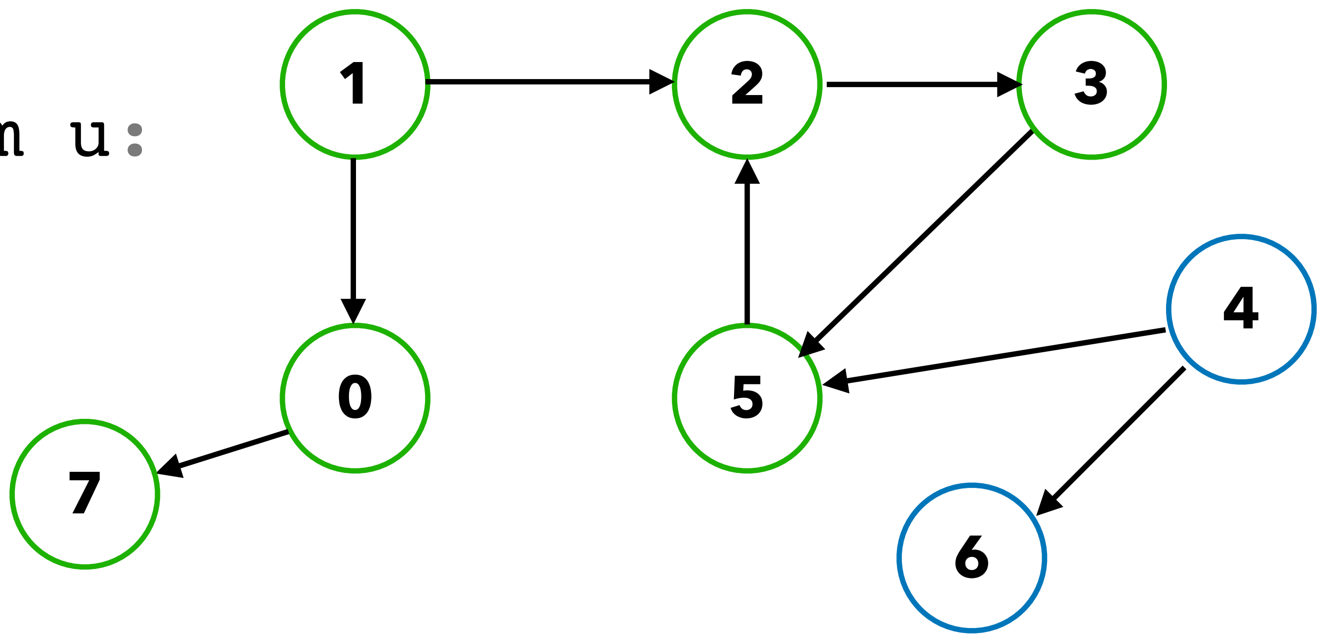

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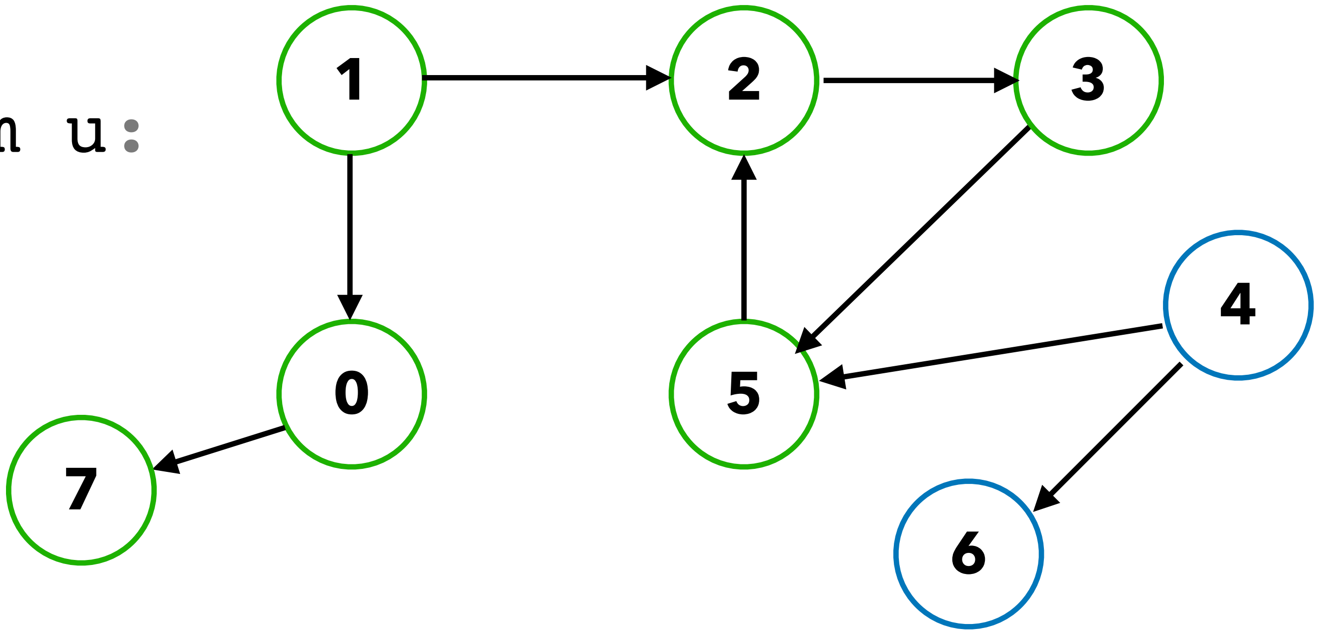

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