# CS310: Homework 7

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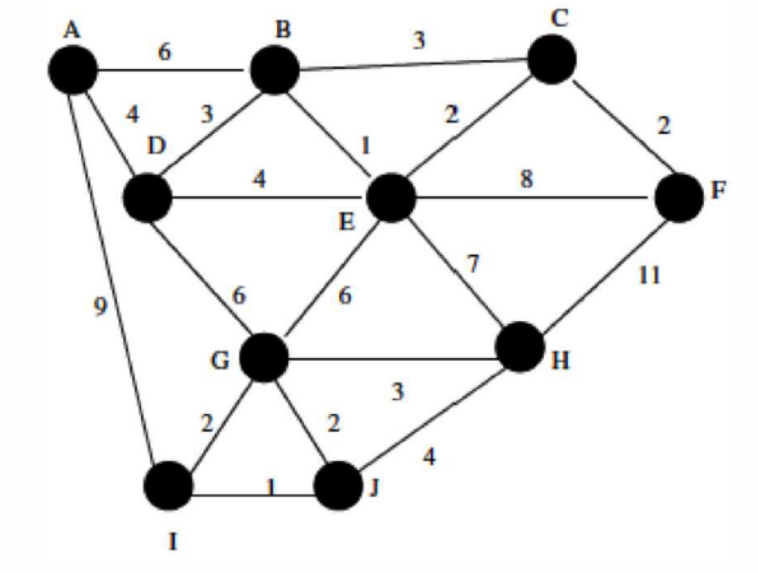
**Exercise (1).** Write the vertices in the order encountered during a BFS, starting from vertex A. Break ties by alphabetical order.



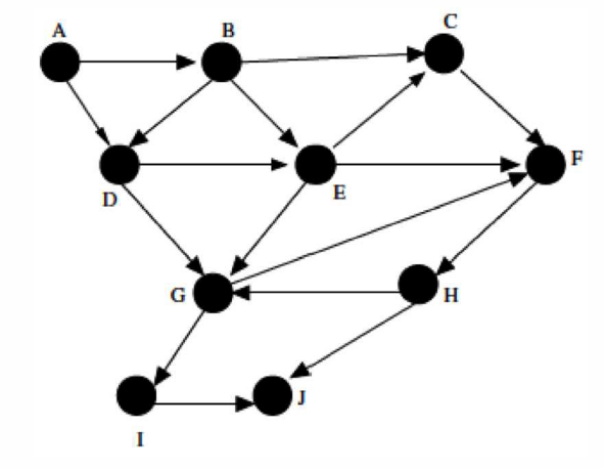

**Solution (1).** Output: A-B-D-I-C-E-G-J-F-H
Working node A. Enqueue B. Queue[B]
Working node A. Enqueue D. Queue[D B]
Working node A. Enqueue I. Queue[I D B]
Dequeue B.
Working node B. Enqueue C. Queue[C I D]
Working node B. Enqueue E. Queue[E C I D]
Dequeue D.
Working node D. Enqueue G. Queue[G E C I]
Dequeue I.
Working node I. Enqueue J. Queue[J G E C]
Dequeue C.
Working node C. Enqueue F. Queue[F J G E]
Dequeue E.
Working node G. Enqueue H. Queue[H F J G]

**Exercise (2).** Do the same with a DFS, and break ties by reverse alphabetical order.

**Solution (2).** Output: A-I-J-H-G-E-F-C-B-D
Push A.

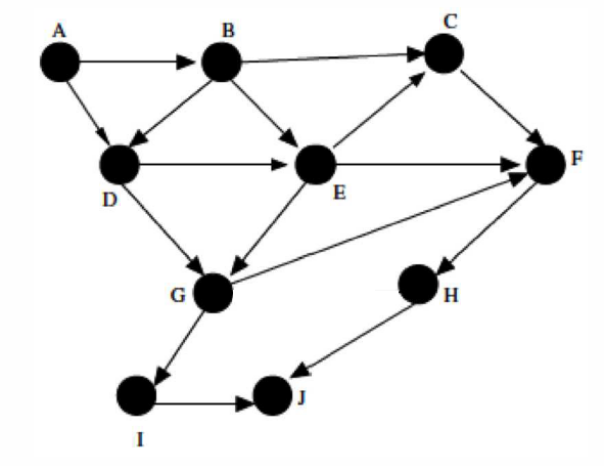
Working node A. Push I. Stack[A I]
Working node I. Push J. Stack[A I J]
Working node J. Push H. Stack[A I J H]
Working node H. Push G. Stack[A I J H G]
Working node G. Push E. Stack[A I J H G E]
Working node E. Push F. Stack[A I J H G E F]
Working node F. Push C. Stack[A I J H G E F C]
Working node C. Push B. Stack[A I J H G E F C B]
Working node B. Push D. Stack[A I J H G E F C B D]

**Exercise (3).** Do a topological sort of the following graph with the edge (H,G) removed.




**Solution (3).** The Graph with edge (H,G) removed:

Topological sort: A-B-D-E-G-I-C-F-H-J




**Exercise (4).** Is the topological sort you found in Problem 3 a unique one? If yes, say so if no, give another topological sort.

**Solution (4).** No, an alternate topological sort is: A-B-D-E-C-G-I-F-H-J