Spring 2024

CS 412 (Algorithms: Design and Analysis)

Weekly Challenge 06: Graph Algorithms

Announced: Friday, February 23, 2024.
Deadline: Friday, March 1, 2024 (11:59 pm PKT).
Total marks: 1.

Instructions: Submit **individually** your solution as a PDF with the file name as your *studentID.pdf*; typeset in LaTeX. You must submit your solution on Canvas.

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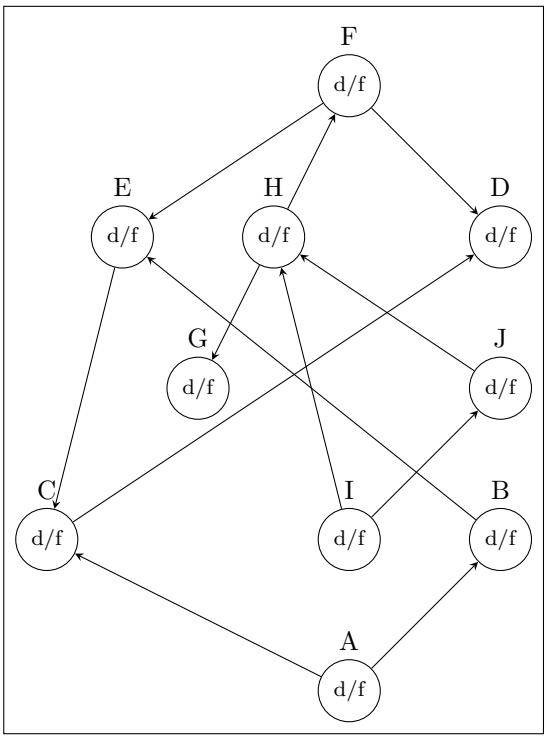
1. (1 point) Consider the graph, $\mathcal{G}$, below with 10 nodes and 13 edges.



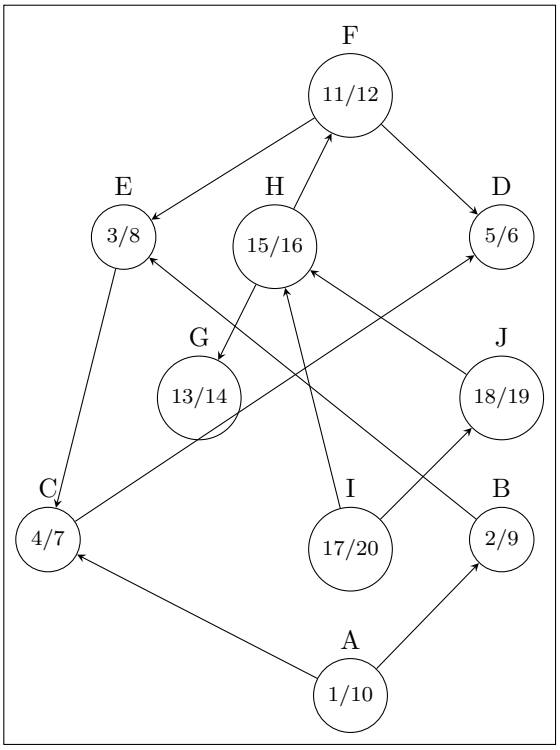
The procedure, DFS($\mathcal{G}$), is executed on the graph such that ties are resolved in alphabetical order.

(a) Redraw the graph below such that each node, n, contains $n.d/n.f$, where $n.d$ and $n.f$ are the node's discovery and finalization times respectively. Mention your starting nodes/nodes under the graph.

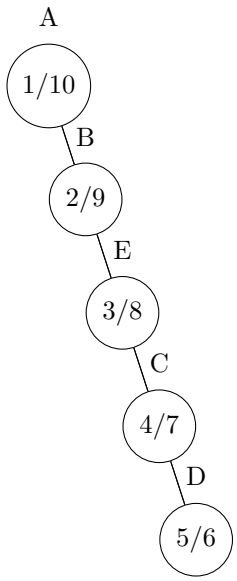
(b) Draw below the corresponding DFS-forest.

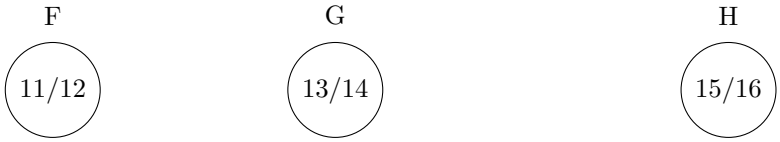
Solution:

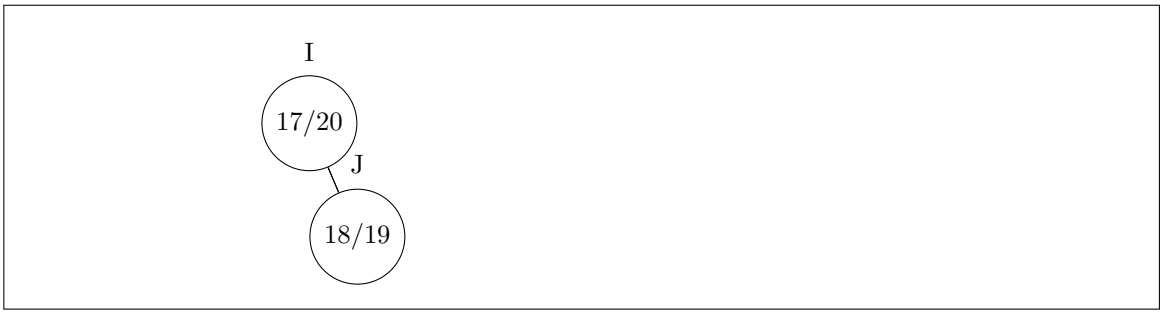
(a) Starting the DFS from node A, and after that, we begin by node F, G, H, and lastly I respectively.



(b) The below DFS-forest correspond to part(a)






I
17/20
J
18/19