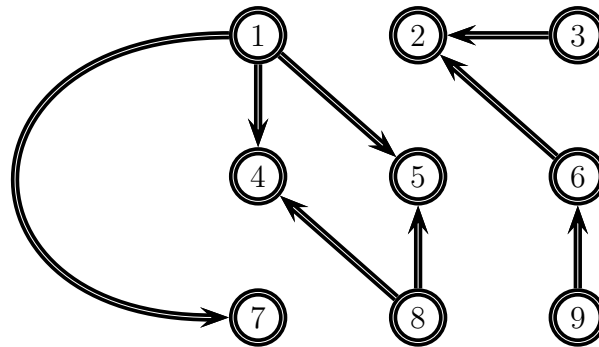


Sample Questions for CS 401 Midterm I

March 13, 2019

Problem Consider the graph below:



Give a valid topological sorting of the vertices of the graph (all edges should go from left to right) by filling out the missing details below:

○ ○ ○ ○ ○ ○ ○ ○ ○

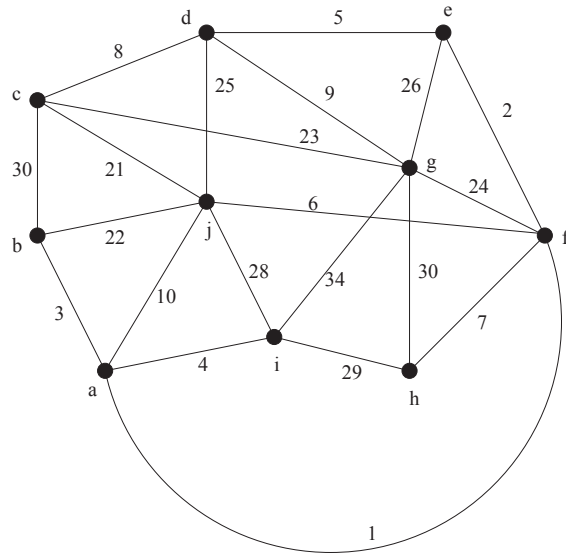


Figure 1: Graph G

Problem Let $G = (V, E)$ be the graph as shown in Figure 1 with $V = \{a, b, c, d, e, f, g, h, i, j\}$.

- (a) Simulate Prim's algorithm to find a minimum spanning tree of G . You only need to show the connected components you are building at the end of **each** step of the algorithm. What is the total weight of your tree?
- (b) Simulate Kruskal's algorithm to find a minimum spanning tree of G . You only need to show the connected components you are building at the end of **each** step of the algorithm. What is the total weight of your tree?