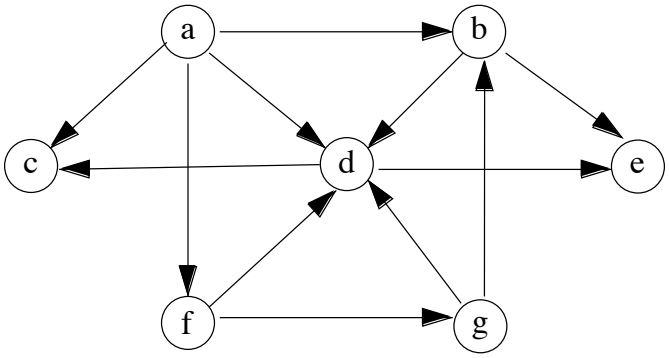
Shortest Paths

Exercise 1 *Topological Order*

A Reversed Topological Sort of a directed acyclic graph $G = (V, E)$ is a linear ordering of the vertices of V such that if G contains an edge (u, v), then u appears after v in the ordering.

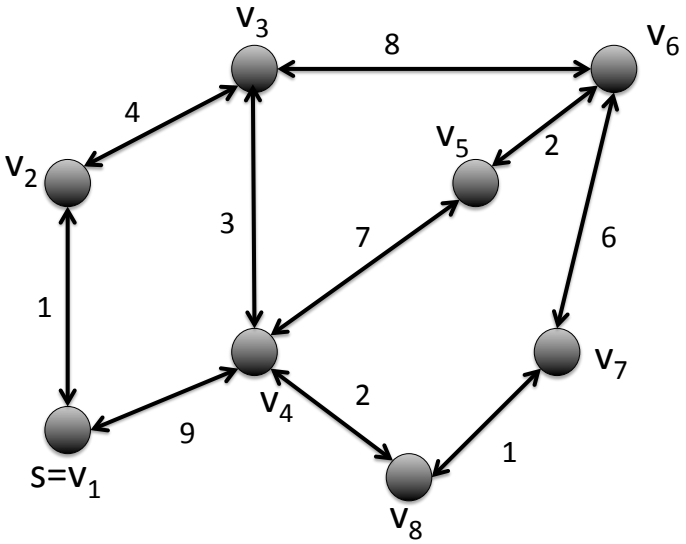
Find a reversed topological sort of the following graph.



Show that the termination order of a DFS scan of a directed acyclic graph is a reveresed topological sort.

Exercise 2 *Shortest Paths*

Consider the following graph.



- Solve the single-source-shortest path problem for the start node s using Dijkstra's algorithm. Show for each iteration which nodes becomes scanned and which edges are relaxed.
- Solve the all-pairs-shortest-path problem for the given graph by using the Floyd-Warshall Algorithm. Show for each iteration k, the distance matrix giving the current cost of a shortest path for any pair of nodes.