CSCI2100: Special Exercise Set 13

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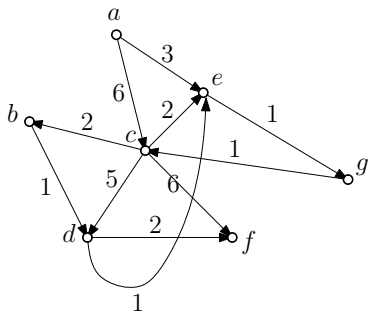
Problem 1. Consider the weighted directed graph below.



Suppose that we run Dijkstra's algorithm starting from vertex a. Recall that the algorithm relaxes the outgoing edges of every other vertex in turn. Give the order of vertices by which the algorithm relaxes their edges.

Problem 2. Let $G = (V, E)$ be a weighted directed graph. Give an algorithm to compute the shortest path distances between all pairs of vertices. Your algorithm should finish in $O(|V|(|V| + |E|) \log |V|)$ time.

Problem 3. Adapt Dijkstra's algorithm to solve the SSSP problem on a weighted undirected graph.