# Chapter 24 Homework
Deadline: 2021/12/17
10:10 a.m

1. Let the source be *s*. Run the algorithms on the graph below:

   a. Run Bellman-Ford algorithm on this graph. Mark the distance of the nodes after each round of relaxation. (You should draw $|V|$-1 graphs for this problem and only use the value last round when relaxing. That is, the update order should not affect the output.)

   b. Run Dijkstra's algorithm on this graph. Mark the node selected, and the distance of the nodes after each round. (The nodes should not be updated after it is selected.)
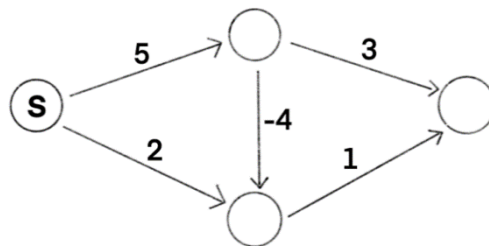
2. Professor Newman thinks that he has worked out a simpler proof of correctness for Dijkstra's algorithm. He claims that Dijkstra's algorithm relaxes the edges of every shortest path in the graph in the order in which they appear on the path, and therefore the path-relaxation property applies to every vertex reachable from the source. Show that the professor is mistaken by constructing a directed graph for which Dijkstra's algorithm could relax the edges of a shortest path out of order.

3. Give an efficient algorithm to count the total number of paths in a directed acyclic graph. Analyze your algorithm.