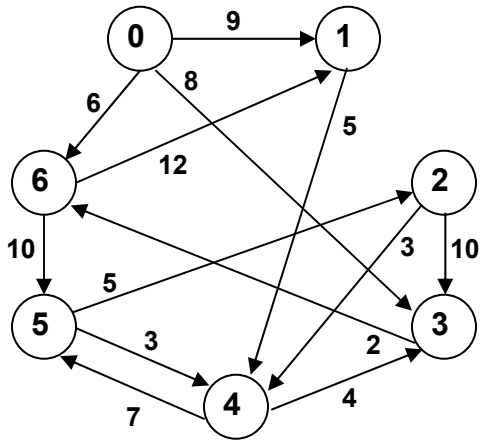


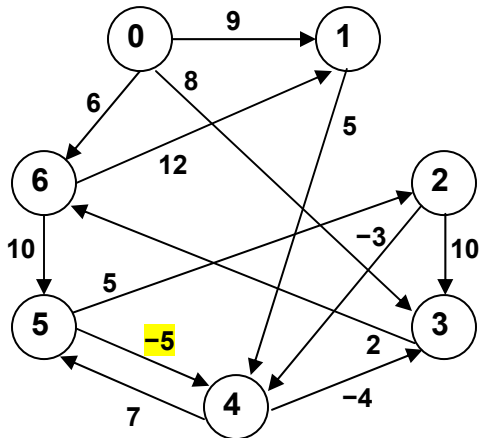
Prepare your answers to the following questions either in a plain text file or in a file that can be opened with Microsoft Word. Submit your file to the Curator system (www.cs.vt.edu/curator) under the heading HW4, by the posted deadline for this assignment. No late submissions will be accepted.

- [30 points] Apply Dijkstra's SSAD algorithm, to find a solution to the SSAD problem for the graph given below. Use vertex **0** as the starting vertex, and express your solution by completing the table below.

vertex	path length	path from 0 to vertex
0	0	n/a
1		
2		
3		
4		
5		
6		



- [30 points] Describe in detail what happens if Dijkstra's SSAD algorithm is applied to the graph given below, **again** starting at vertex **0**:



- [40 points] Suppose that G is a directed graph with N vertices and E edges. The *out-degree* of a vertex v in G is the number of edges starting at v and ending at some other vertex u in G . Similarly, the *in-degree* of a vertex v is the number of edges starting at some other vertex u and ending at v . Given an adjacency-list representation of a directed graph, in Θ terms, how many operations would it take to find the in-degree of every vertex in G in the most efficient manner you can devise? Explain your answer, which should involve N and/or E , and give pseudocode for your algorithm.