Due Date is Sunday March 23.

The objective of this assignment is to help you understand how to with graphs and design your own graph algorithms.

1. Write a java component that that will generate a random directed graph (DAG) with n nodes and max of m degree on each node where a node will have 0, 1, and up to m edges to other nodes in the graph. For each generated edge assign it a random weight between 1 and k, where k is some constant.
2. Write a java component to generate random sequences of nodes (a path in the graph). Start with nodes that zero in-degree edges.
3. Write a decision component to determine if the generated sequence in 2 is a topologically sorted sequence. Repeat 2 and 3 until a valid sequence is found.
4. Write a component to determine if a given path in the graph provided as input) is a shortest path. Use Dijastra’s algorithm.

For your graph representation you must use edge list data structure. These exercises are critical for doing well on the exam. So invest time in it right away.