

This homework covers shortest paths, network flow and other graph algorithms, and modeling with graphs. It is due in class Wednesday, March 25.

See the Policies page on the course website for information about revise-and-resubmit, late work, and academic integrity as it applies to homework.

Write your solutions carefully — your work should be neat, readable, and organized.

1. Do the homework #7 drill problems on Canvas. (Look for `hw7 drill` in the Quizzes section.)

For the following problems, explain how to solve the problem by modeling it as a graph problem. Address the following things in your solutions:

- (a) What do the vertices of the graph represent? The edges? What is the solution to the problem in terms of the graph?
 - (b) Is the graph undirected or directed? Weighted or unweighted? (If weighted, what do the weights represent?) Simple or not simple? Sparse or dense? Cyclic or acyclic? Embedded or topological? Implicit or explicit? Labeled or unlabelled? Provide a brief explanation with each answer.
 - (c) Give an efficient algorithm for solving the problem in terms of a well-known graph algorithm (i.e. one discussed in class). Design graphs, not algorithms! Imagine that you have a library of implementations of well-known graph algorithms that you can use — design your graphs so that you can use them as-is instead of having to modify an algorithm or implement your own.
2. ADM 7-14, page 238.
 3. ADM 7-22, page 239.
 4. ADM 7-31, page 240. For (b), express the number of vertices and the number of edges in the graph in terms of n , k , and α .