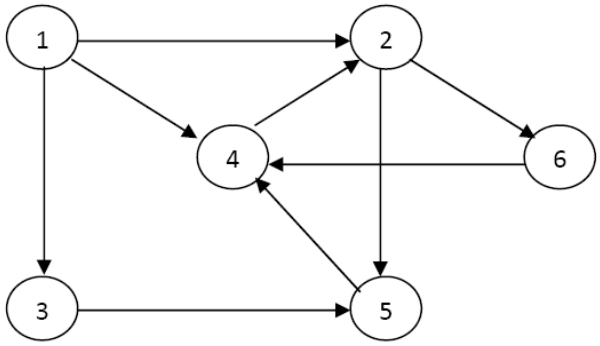
COMP 157 Assignment 7

1. Exercises 8.4.9

   9. ▷ Design a dynamic programming algorithm for the ***change-making problem***: given an amount n and unlimited quantities of coins of each of the denominations $d_1, d_2, \ldots, d_m$, find the smallest number of coins that add up to n or indicate that the problem does not have a solution.

2. Use dynamic programming to find the transitive closure of the following directed graph. Show all intermediate matrices in your answer.



3. Use dynamic programming to find the maximum possible value of the following knapsack problem. Solve the problem twice: once ordering the items top to bottom, and then ordering the items bottom to top. This will verify that the item order does not affect the result.

capacity = 20

value	weight
10	9
30	8
23	5
15	3
18	4
40	6
20	7

Submission Requirements:

- Submit your answers via Canvas.
- All submissions must be typeset. No handwritten work will be accepted.
- Word or PDF formats are preferred. If submitting documents in another format, include a separate text note indicating tools needed to read the document.