CS472 Assignment 4: Dynamic Programming

CS472 - Analysis of Algorithms

February 27, 2017

1 Problems

1. Apply the dynamic programming algorithm for change making to find all of the solutions to change-making problem for coins worth 1 cent, 3 cents, and 5 cents for an amount of 9 cents.

2. Design an algorithm to solve the rod-cutting problem: Find the total sale price that can be obtained by cutting a rod that is n units long into integer-length pieces if the sale price of a piece that is i units long is p_1 for $i = 1, 2, \ldots, n$. What are time and space efficiencies of your algorithm (in terms of "Big-Oh")?

3. Provide an example of a graph with negative weights such that the Floyd-Warshall Algorithm does not yield a correct result.

4. Apply the Floyd-Warshall Algorithm to the graph in Figure 1. Show your work.

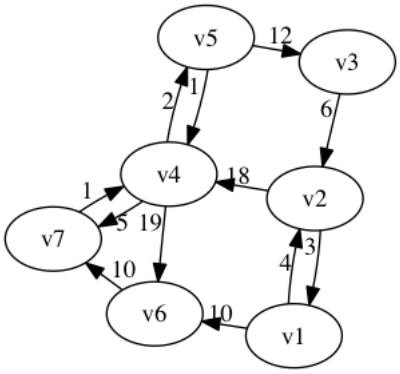

Figure 1: Graph for all problems

2 Submission instructions

You will need to attach a PDF file to your problem submission in Blackboard that details your responses to the questions in the previous section.