

Name: _____

CSSE/MA 473 Worksheet for Class #22

January 17, 2023

Dynamic Programming Examples

1. Warmup: **Coin-row problem.** There is a row of n coins whose values are some positive integers c_1, c_2, \dots, c_n , not necessarily distinct. The goal is to pick up the maximum amount of money without ever picking up two (originally-)adjacent coins c_i, c_{i+1} . Solve this using dynamic programming.

2. **Longest common subsequence.** This problem is essentially what is solved by GNU's `diff` program for comparing files. A *subsequence* of a string does not need to be contiguous; e.g., `ACE` is a subsequence of the string `ABCDE`. The **longest common subsequence** problem gives two strings S, T of lengths n_S and n_T respectively and asks to find the longest subsequence that they have in common.

Solve this problem using dynamic programming, and analyze your solution.