Introduction to Bioinformatics Algorithms
Homework 1

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Problem 1: Coin Change
Write a function that takes an integer d, an array c, where $c[1] > c[2] > \ldots > c[d] = 1$, an integer n, and an array k, and performs the greedy coin change problem to make n. Therefore, it should modify k such that:

$$c[1]k[1] + c[2]k[2] + \ldots + c[d]k[d] = n$$

Also make your function return $\sum_{i=1}^{d} k[i]$, which is the total number of coins used.

Problem 2: Exhaustive enumeration
Write two algorithms that iterate over every index from $(0, 0, \ldots, 0)$ to $(n_1, n_2, \ldots n_d)$. Make one algorithm recursive and one iterative.

Problem 3: Rabbits with limited life span
Modify the Fibonacci sequence by making every pair of rabbits die after giving birth to their k^{th} pair (assume $k \geq 1$). Your program should output F_n given n and k. Investigate the growth of the sequence by exploring several values of k.