1. List the members of your group below. Underline your name.

2. Consider the US coins in common circulation: penny, nickel, dime, and quarter, with denominations (values) respectively 1, 5, 10, and 25 cents. Indicate all possible sets of coins of these denominations whose value adds up to each of the following (in cents). Explain briefly why your answers are correct.[1]

   (a) 10

   (b) 47

   (c) 88

3. The powers-that-be have introduced a new coin, named *chime*, with denomination 35 cents, into the mix of the other US coins of Question 2. Repeat that question for this new set of coins.

4. For the denominations of Question 2 and Question 3 (separately), determine the smallest number of coins that add up to each of the values of Question 2. Explain why your answers are correct.

[1] This question and those that follow are loosely based on a well known problem, addressed also by Problem 15-1 of the textbook (p. 446).

5. Provide pseudocode for a *greedy algorithm* that solves the change-making problem of Question 4. Explain briefly why it is a greedy algorithm that provides a *feasible* solutions, although perhaps not *optimal*. (Optimal here means there is no solution with fewer coins.)

6. Trace the action of the pseudocode of Question 5 on both sets of denominations introduced earlier.

7. Answer the following later, posting on the class discussion forum (informal homework):

   (a) Prove that a suitable greedy algorithm (such as that of Question 5) is guaranteed to provide an optimal solution for the denominations of Question 2.

   (b) Determine a property (as general as possible) of a set of coin denominations that guarantees optimality of the greedy solution.

   (c) Provide an algorithm, as efficient as possible, that is guaranteed to produce an optimal solution for any amount and any set of denominations.