Chapter2 Programming Assignment: Making Change

CS141 Introduction to Programming, Fall 2013

Due: Friday, Sept 13, 2013, before class.

Submit via WISE Assignments for our class by the above due date. Name your java file Chp2ComputeChange.java. Add appropriate comments so someone reading your code can easily follow what it is doing. You will be asked to demonstrate your code in lab on Friday (the demonstration is a required part of the lab).

Problem: Counting Monetary Units

Suppose you want to develop a program that classifies a given amount of money into smaller monetary units. This is the same procedure as you would follow if you wanted to make change. The program lets the user enter an amount as a **double** value representing a total in dollars and cents, and output a report listing the monetary equivalent in dollars, quarters, dimes, nickels, and pennies, as shown in the sample run.

Your program should report the maximum number of dollars, then the maximum number of quarters, and so on, in this order.

Designing a Strategy

Design a strategy to accomplish this task. Try to write the pseudocode. (After you think hard and come up with your pseudocode, compare it with the algorithm described in the next page.)

Here are the steps in developing the program:

1. Prompt the user to enter the amount as a decimal number, such as **11.56**.
2. Convert the amount (e.g. **11.56**) into cents (**1156**).
3. Divide the cents by **100** to find the number of dollars. Obtain the remaining cents using the cents remainder **100**.
4. Divide the remaining cents by **25** to find the number of quarters. Obtain the remaining cents using the remaining cents reminder **25**.
5. Divide the remaining cents by **10** to find the number of dimes. Obtain the remaining cents using the remaining cents reminder **10**.
6. Divide the remaining cents by **5** to find the number of nickels. Obtain the remaining cents using the remaining cents reminder **5**.
7. The remaining cents are the pennies.

8. Display the result.

Sample Run

The following shows a sample run result (bold words indicate what has been displayed on the screen, red words indicate user input):

What is your name? Joe smith
Hello Joe Smith, how are you today? Let's count your money.
Please enter an amount in double, for example 11.56: 37.42
Your amount $37.42 consists of
37 dollars
1 quarters
1 dimes
1 nickels
2 pennies

Hint: all displayed final amounts are integers.

0.1 Challenge

Test your program with input 10.03, is the result correct? Why? How can you fix it?