CMPS 4143 Contemporary Programming Languages
Program 2: 100 points
Due: Monday, October 5, 2015

Purpose: To use finals, classes, arrays and ArrayList (13.2.2) and sort method, to perform file input and output (sec. 3.7.3). This should apply everything you learned in chapters 3 and 4. Also you will use the class Random in *another* program to generate the input file – Consult the Java API on the web.

Problem: Write a program that simulates a coin sorter.

Method: The program reads in a list of coin denominations a file and inserts them into an array list until the marker (-1) is encountered, then puts them in an array, sorts them - ordering the denominations by numeric value. It will then fill up "rolls" of coins. Rolls can hold 50 pennies, 40 nickels, 50 dimes, or 40 quarters. Then more coins can be read in until the next marker, put them in the array, sort, fill more rolls, … over and over again until the end of file.

Declare/define a class CoinSorter. Choose your methods – I want two constructors, a toString method, a serialize method (that puts the ArrayList into the array and sorts it), a fillRolls method, computeTotal method, and any others you deem necessary.

An ArrayList must be used to contain the coin denominations. A sorted array must be used to contain the coin denominations sorted. CoinSorter has the ArrayList, the array, the four counts of filled rolls of various coins, and the four counts of partially unfilled rolls.

Main should print headings, prompt for file names, (could randomly generate and input file, close it and re-open it for reading), then read and process data in the file, close the files, then stop. Main should have a double nested loop – a while !eof loop with a while !marker inside it. Declare and define methods that do I/O in the MAIN class, but not in the MAIN method! (You might also use another method to print just headings.) There should be NO I/O in the classes other than error messages and NO I/O in the main method.

Your main class should include methods to show Introductory and Exit screens. Make the output pretty!

Input from the keyboard: Names of input and output files

Input from a file: *Write a Java program to randomly generate approximately 500-800 numbers and write about 20 per line for this file – then insert -1's in a few places. Consult the Java API on the Random class.*

Format:

```
10 25 10 5 1 1 1 5 25 10 5 5 5 1 1 1 1 1 1 10
25 25 10 1 1 1 1 5 5 5 5 5 1 1 1 1 5 25 10 10
-1 5 5 5 1 10 10 5 0 10 25 1 1 1 25 25 5 5 5 -1
5 1 5 5 1 10 5 5 5 10 10 10 1 1 1 25 1 5 10 25
```

Output to a file: ***NOTE: Does not correspond to above input!!***

```
After 1st marker
3 rolls of pennies + 14 pennies  =  $1.64
2 rolls of nickels + 2 nickels =    $4.10
1 roll of dimes + 1 dime =          $5.10
2 rolls of quarters + 5 quarters = $11.25
Total =                            $22.09

After 2nd marker (adds on to totals above)
4 rolls of pennies + 21 pennies  =  $2.21
3 rolls of nickels + 3 nickels =    $6.15
2 roll of dimes + 2 dimes =         $10.20
2 rolls of quarters + 7 quarters = $11.75
Total =                            $30.31
```

Etc.

Turn in:

- print outs of all source files, including your program that generated the input file.
- two input files (write multiple denominations per line!!!)
- two output files formatted nicely
- electronic copy of all source, class and executable files (must run in java SE 6+).
- flash drive
- envelope