CSE 3302 Fall 2017

Lab 3a

This lab has one problem as described below.

For this problem you must perform the following:

1. Develop only the java Functional (Lambda Expression) program solution - this MUST use lambda expressions and .stream() operations ONLY.
2. You are to develop and get running in Eclipse.
   1. Code.
      1. Main program.
         1. You need to create the problem as a main program - the code is in the body of the program. You may create methods within this main class that does the computations called from the main method - please do not put methods in other classes.
         2. Name this class FunctionalZipCode.java
      2. Data declarations
         1. You will use the same zipCodeClass.java from Lab 02b:
            1. int zipCode
            2. String typeZip
            3. String cityName
            4. String countyName
            5. int estPop
      3. Algorithm
         1. Input (this is the same L02b input data but randomly ordered)
            1. File Name - the program will read in the file:

*L03a zip\_code\_database.csv*

* + - * 1. The file has 5 columns:

1. int zipCode
2. String typeZip
3. String cityName
4. String countyName
5. int estPop
   * + 1. Output.
   1. File name. The output is written to a file:

*Problem\_3a\_output.txt*

* 1. Output format: the file writes the following header



* 1. **Each column is delineated by a tab character both in the header and in the subsequent data.**
  2. Each subsequent line will have the following (refer to the example file when in doubt):

The county name will be listed in A-Z alphabetic order (list ONLY ONCE for each city in that county).

The name of each city in the county listed in A-Z alphabetic order (list the city name in each county only once)

The type of each zip code (PO BOX, STANDARD, or UNIQUE) in THIS ORDER - for each county city pair. Print out only the type that is relevant for that county city pair.

The lowest numerical zip code for the county, city, zip type 3-tuple (this column is the First Zip column)

The number of unique zip codes for each county, city, zip type 3-tuple

The total county population (this is printed only once for each county)

* 1. Output Data format
     1. Number of zips (No. Zips) is an integer with no decimal places
     2. Population data (City Pop, County Pop) must be integer, no decimal place and with thousands separators
     3. Zip Type as mentioned above is one of the following: PO BOX, STANDARD, or UNIQUE. They are listed in this order and only those that are relevant for the county city pair
     4. First zip is a 5-digit integer
        1. Code constructs
           1. Operations.

You are ONLY allowed to use Lambda expressions and Stream operations

You are not allowed to use Collections.sort or basic for/while loops (other than to read the file data)

You may use if statements only for the logic associated with writing the unique county data (see above)

* + - * 1. Data Structures. You may only use the collection ArrayList.
        2. Exception handling - surround necessary code with try and catch blocks or throw exceptions. Your code must NOT crash when properly run but you may assume the input and output files are there and correct.
      1. Example files (two files are provided to help with understanding of the required output)
         1. zip\_code\_database.csv (this file is sorted by zip code to help you better visualize the input data).
         2. Problem\_3a\_output EXAMPLE.txt - this is the sample output from the example file (zip\_code\_database.csv)
      2. Processing notes
         1. Notice that the data is not organized by county or city - your program must address that. You are not allowed to manipulate the input file.
         2. Your code must not hard-code county or city names - it will need to build Streams from the data file as needed.
      3. Verification of output
         1. How do you know what is correct? View this as a work assignment where you are given a large database and have to produce a report that can be run via your program. There is no solution to compare it with. You need to analyze the input data and determine if your output is correct.

Submission checklist

1. All materials should be delivered in a single .zip (not .rar) file and named lastname\_firstname\_ID Four (4) files total as follows.
2. Java files - you should have 2 java files:
   1. FunctionalZipCode.java
   2. zipCodeClass.java
3. You should have 2 \*.txt (files)
   1. Problem\_3a\_output.txt
   2. L03a zip\_code\_database.csv

Uniqueness of solution. Your submittal needs to be distinct from what everyone else submits. GTAs will review each submittal - exact appearances in submittals will result in an investigation - if the investigation determines that two submittals are identical both submittals will receive a zero for the entire assignment.