Assignment #7

Problem Solving and Programming in C++
Department of Computer Science
Old Dominion University

Objective: The main objective of this assignment is checking the students' ability to work with **ADT**s. In this week's assignment, you will be writing the interface of an **ADT** in order to conform to the requirements of a larger application.

Description: Multi-Level-Marketing is a quickly growing industry in the United States. Many men and women are deciding to work from home, selling various goods to their friends and family due to the convenience and possible salary that can be made. Multi-Level-Marketing consists of a hierarchy of workers and customers and is sometimes referred to as a pyramid scheme. At the bottom of the chain is the customer who purchases a good or service from a salesman. Above a salesman, there is always a regional salesman/manager who is supplying and managing these bottom level salesmen.

Suppose a company that employs a multi-level-marketing strategy is not doing very well and needs to make cuts. After examining the budget, upper level management has realized that some poorly performing salesmen actually cost more to insure than they make for the company. Therefore, upper level management has decided that the lowest performing salesman of each regional manager should be fired. Any fired salesmen's customers should be distributed to the rest of the salesmen as evenly as possible. Unfortunately, this company does not have a very robust filing system and needs a way to automatically calculate who needs to be fired. They ask *you* to create an automated system that given a text file of the worker's and customer's information can automatically detect who should be fired and which salesmen will get left over customers. Given the customer and worker information, you are required to print the hierarchy of this region to the screen before and after the firing.

Input File: The input file you are given first lists the information of the regional manager consisting of an ID, a name, and a salary. Your program is required to store this information and provide ways to manipulate this information properly. For this assignment, a manager always has 5 salesmen working for them. The next item to extract from the file is a salesmen's information. A salesman has an ID, a name, a gender, and an indication of how many customers they have. After a

salesman's information comes the information of all the customers that this worker is selling to. For example, if a salesman sells to two customers, the next two entries will be customer information (here an "entry" begins and ends with a blank line). A customer's only information is a name and a total amount of money they have spent. This same pattern is repeated until all 5 salesmen and their customers are printed.

Help: The best start, for this assignment, is identifying (naming) the **ADT**s – this is the most critical step. Good decisions (choices) naming the ADTs facilitate the implementation. Please spend enough time thinking about the possible names of the ADTs, which you can use to implement this assignment. The names of these ADT's should be very obvious from the description above.

Example output: The way that you print out the hierarchy of the region is left up to you. If the information is easy to read and understand, you will get full credit. Be sure to print out the region hierarchy before and after a salesman is fired. Here is an example:

```
Manager:        Jabob Smith     120000
_____________________________________
       SalesPerson:     Gwenn Mccloy          1033547         97.67
_____________________________________________________________________
              Customer:        Hildegard Rutz         39.46
              Customer:        Lydia Feng             58.21
       SalesPerson:     Hildegard Rutz        1478021         1.23
_____________________________________________________________________
              Customer:        Noreen Encarnacion             1.23
       SalesPerson:     Deirdre Stayer        1098576         137.72
_____________________________________________________________________
              Customer:        Wade Peffer            5.24
              Customer:        Ronda Ord              89.99
              Customer:        Lacresha Lawrence              22.54
              Customer:        Zackary Schiro         19.95
       SalesPerson:     Deirdre Stayer        122354          2.22
_____________________________________________________________________
              Customer:        Marcus Curl            2.22
       SalesPerson:     Tyesha Overton        187213          54.84
_____________________________________________________________________
              Customer:        Celine Mccutchan               52.29
              Customer:        Debra Widger           2.55
=====================================================================

Manager:        Jabob Smith     120000
_____________________________________
       SalesPerson:     Gwenn Mccloy          1033547         97.67
_____________________________________________________________________
              Customer:        Hildegard Rutz         39.46
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_____________________________________________________________________
              Customer:        Wade Peffer            5.24
              Customer:        Ronda Ord              89.99
              Customer:        Lacresha Lawrence              22.54
              Customer:        Zackary Schiro         19.95
       SalesPerson:     Deirdre Stayer        122354          2.22
_____________________________________________________________________
              Customer:        Marcus Curl            2.22
       SalesPerson:     Tyesha Overton        187213          54.84
_____________________________________________________________________
              Customer:        Celine Mccutchan               52.29
              Customer:        Debra Widger           2.55

Process returned 0 (0x0)   execution time : 0.031 s
Press any key to continue.
```

Submission notes:

- Zip the entire Code::Blocks project containing all the .cpp, .h, .cbp files name the zipped file "Assg7_cslogin.zip", where the cslogin is your login ID for the computers at the Department of Computer Science at ODU.
- Submit the zipped file using the appropriate Blackboard link.