Computer Science II — CSci 1200
Homework 4
Due: October 7, 2004

The program you write for this homework is worth 75 points. The solution is due by 11:59:59pm on Thursday, October 7. See the handout on homework and programming guidelines for style, submission instructions, and grading criteria. Remember to zip your files together prior to submission and then submit only the zip file.

Introduction

Peach Music Store has had a catastrophic computer failure. The only customer information they have left is record of the actual transactions of downloading or copying songs. They need to recover their list of songs and their list of customers, and they need to print some information about these. They have hired you to write a program that will solve their problem.

Input

The input is simple. Each line of input will contain three strings — the customer-id, the song-id and the song-title. Both types of ids will be lower case combinations of letters and digits. There will never be a different song-title with the same song-id. (You don't need to check.) The input will end with the end of file. If you haven't already done so, please learn to use the input file redirection described at the very end of Homework 2.

Some Definitions

The first time your program inputs a particular combination of customer and song, it should assume that is the first time the customer downloaded the song. Peach charges $0.50 for this download. The next four times your program inputs a combination of customer and song, consider it an allowed, free copy. Any subsequent input of a customer/song combination is an extra copy, and the customer should be charged an additional $0.50 for each copy. Thus, for example, if a particular combination of customer and song appears 8 times in the input, the customer owes $2.00.

What Must Be Computed

The output must be in several parts:

- Each song must be output, one song per line, together with the number of customers who have downloaded each (count the first download by a customer only). Output the songs by order of number of downloads, with the highest number of downloads first. For songs that have the same number of downloads, output the song with the lower id first (use operator< on strings). The output for each song should include the song id, the song title and the number of people.

- Output a blank line after all the songs have been printed. Then output the information about the customers in the order that the customers purchased their first song.

- The output for each customer will cover multiple lines. On the first line output the customer id and the total amount owed. Then on separate lines, output the song id and the number of downloads / copies. These songs should be output by the order in which the customer first purchased them.

Example input and output will be posted on the web. Please follow the output format as closely as you can. Don't worry too much about spacing, however. Don't output ANY extra information.

Details and Requirements

Your program needs to demonstrate good use of classes and functions; some computations are best done as part of a class and some are best done in functions or in the main program. Your program must show the use of at least one list. Remember that the standard library `sort` algorithm does not work on lists!

Finally, one of the important issues to think about is how to determine in your code when a customer first downloads a song.