COSC2430 Hw2: Student's info management system

(Linked lists practice)

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1. Introduction

You will create a C++ program to read the input file which has a group of records that stand for the information of students in one class. A group of sorting commands will be given to you for sorting the records. You can use any algorithm to do the sorting. After that, you need to output the results to the output file.

2. Input files and Output file

a. Input file

1) The input file has multiple records (number > 1 and <1000). Your program should read and process the records one by one from the beginning to the end.
2) Each record has uniform attributes (columns), the attributes appear in a fixed order, a record should contain all the attributes and values. Notice that the input file may contain duplicated records. The key for each record is id value, which means two records have same id value can be recognized as duplicated. You should always update duplicated records' value with the

latter one. When name value has more than one words, the separator would be underline "_". Except for useful information in records, no more character or space will be given. Empty line may appear.

3) The id value always uses 7 digits ranging from 0 to 9. DOB values always with the format YYYY-MM-DD, which are reasonable dates. GPA value always with the format X.Y, where X is the unit part and Y is the decimal part.
4) Requirement: After reading records, they should be added to the linked list with id ascending order.
5) The input file may need you to delete records. Using "delete id" when deleting a record. Deleted record should not be shown in output file unless it is added again later.

b. sorting command file
    1) The sorting command file only contains commands: id, first, last, DOB and GPA (case sensitive), there will be no space(s) in the file. Notice that each line only contains one command, and one command only contained in one line. Empty line may appear.
    2) The command file should be processed sequentially.
c. output file
    1) The output file should be clean, one record in one line, the line should end in '\n'. No space in records.
    2) The outputted records in the output file should keep the same records as

input file, the only difference is the outputted records are ordered. You should not change them to upper or lower case or truncate them.

3. Operations

1) A command with an attribute name means you need to sort the values of the attribute with the ascending order.
2) When processing multiple commands, the operation should only sort the necessary records. The results for latter commands should always based on former commands' results.
3) All the attribute names are case sensitive.

4. Program specification and Examples

Your C++ program will be compiled and tested by the TAs. The result file should be written to output file. When calling your program, the format would be one of the two standard types as below. Notice that also the quotes in the program call, to avoid Unix/Windows get confused.

The general call to the executable is as follows:

sort "input=input1.txt;output=output1.txt;sort=sort1.txt"

Call example with another command line type.

sort input=input1.txt output=output1.txt sort=sort1.txt

Example 1 of input and output

input11.txt

{id:1234567,first:Mary,last:Green,DOB:1996-10-03,GPA:4.0}
{id:1234568,first:Peter,last:White,DOB:1997-05-22,GPA:3.8}
{id:1654238,first:Nick,last:Park,DOB:1995-08-18,GPA:4.0}
{id:1234587,first:Katy,last:Green,DOB:1995-08-18,GPA:4.0}

sort11.txt
id

Command line:
sort input=input11.txt output=output11.txt sort=sort11.txt

output11.txt
{id:1234567,first:Mary,last:Green,DOB:1996-10-03,GPA:4.0}
{id:1234568,first:Peter,last:White,DOB:1997-05-22,GPA:3.8}
{id:1234587,first:Katy,last:Green,DOB:1995-08-18,GPA:4.0}
{id:1654238,first:Nick,last:Park,DOB:1995-08-18,GPA:4.0}

Example 2 of input and output

input12.txt
{id:1234567,first:Mary,last:Green,DOB:1996-10-03,GPA:4.0}
{id:1234568,first:Peter,last:White,DOB:1997-05-22,GPA:3.8}
{id:1654238,first:Nick,last:Park,DOB:1995-08-18,GPA:4.0}
{id:1234587,first:Katy,last:Green,DOB:1995-08-18,GPA:4.0}
delete 1234568
{id:1234570,first:Peter,last:White,DOB:1997-05-22,GPA:3.8}

sort12.txt
id
DOB

Command line:
sort “input=input12.txt;output=output12.txt;sort=sort12.txt”

output12.txt
{id:1234587,first:Katy,last:Green,DOB:1995-08-18,GPA:4.0}
{id:1654238,first:Nick,last:Park,DOB:1995-08-18,GPA:4.0}
{id:1234567,first:Mary,last:Green,DOB:1996-10-03,GPA:4.0}
{id:1234570,first:Peter,last:White,DOB:1997-05-22,GPA:3.8}

Example 3 of input and output

input13.txt
{id:1234567,first:Mary,last:Green,DOB:1996-10-03,GPA:4.0}
{id:1234568,first:Peter,last:White,DOB:1997-05-22,GPA:3.8}
{id:1654238,first:Nick,last:Park,DOB:1995-08-18,GPA:4.0}
{id:1234587,first:Katy,last:Green,DOB:1995-08-18,GPA:4.0}
{id:1654238,first:Nick,last:Park,DOB:1995-08-18,GPA:4.0}
{id:1654238,first:Nick,last:Park,DOB:1995-08-28,GPA:4.0}

sort13.txt
id

Command line:
sort input=input13.txt output=output13.txt sort=sort13.txt

output13.txt
{id:1234567,first:Mary,last:Green,DOB:1996-10-03,GPA:4.0}
{id:1234568,first:Peter,last:White,DOB:1997-05-22,GPA:3.8}
{id:1234587,first:Katy,last:Green,DOB:1995-08-18,GPA:4.0}
{id:1654238,first:Nick,last:Park,DOB:1995-08-28,GPA:4.0}

5. Turn in your homework

Your program should output result within 2 seconds, after will be killed by system.

Make sure to create a folder under your root directory, name it hw2 (name need to be lower case), only copy your .cpp and .h files to this folder, no testcase.

Homework is individual. Your homework will be automatically screened for code plagiarism against code from the other students and code from external sources. Code that is copied from another student (for instance, renaming variables, changing for and while loops, changing indentation, etc.) will be detected and result in "0" in this homework. The limit is 50% similarity. Here are some previous homework which been found copy each other (the main function has been deleted).

ps. This document may have typos, if you think something illogical, please email TAs for confirmation.