CSE142 – Spring 2017

Homework #3

Due: 14.05.2017

In this homework, you will write a library simulation program using linked lists. User will be able to add, delete and update book records. Each book record should be kept as a linked list node. Your program will save the book records into a text file.

Your program should be menu driven and have the abilities below:

- List all records.
    Program will display all the book records.
- Update a record.
    User can update a book's name or author.
- Create a new record.
    User can create a new book.
- Delete a record.
    User can delete a record using its id.
- Sort books with respect to their ids.
    Program will sort books according to their ids in ascending order and display them.
- Sort books with respect to their names.
    Program will sort books according to their names in ascending order and display them.
- Sort books with respect to their author names.
    Program will sort books according to their author names in ascending order and display them.

Every book will have an **id, name** and **author.**

When **adding** a new record, user will enter id, name and the author of the book. If the id does not exist, the new record will be added to the list in correct sorted position.

When **updating** a record, your program has to ask for the id of the book to be updated and get the new information from the user. Then the record will be updated with the new information.

When **deleting** a record, user will enter the id of the book to delete it. If the id exists, the record will be deleted.

When user wants to **sort books with respect to book ids,** the records in the linked list will be sorted according to the ids and displayed on the console screen. This is also the default behavior of the program.

When user wants to **sort books with respect to book names,** the records in the link list will be sorted according to the book names and displayed on the console screen. After this operation, any new record will be inserted in the correct position with respect to the book names.

When user wants to **sort books with respect to book author names,** the records in the link list will be sorted according to the author names and displayed on the console screen. After this operation, any new record will be inserted in the correct position with respect to the author names.

When user wants to display the records, the books will be displayed according to the last sorted version.

The book names will be in TheFullBookName format without any space in between the words. The author names will be in FirstnameLastname format also without any space.

After your program is run, firstly it will read any possible existing file (in which the entries are assumed to be sorted by id) and create a linked list according to the records previously saved, and it will update the file with current records (sorted according to id) upon exit.

Sample runs of the program are as follows:

(Your program's output is given in black. User input is in red.)

```
LIBRARY PROGRAM
1 - List all books
2 - Update a book
3 - Create a new book
4 - Delete a book
5 - Sort all books according to id
6 - Sort all books according to book name
7 - Sort all books according to author name
8 - Exit
Enter your choice : 1

Id    Book Name    Author Name
==    =========    ===========
```

```
1       Kasagi       OmerSeyfettin
2       Yaban        YakupKadriKaraosmanoglu

LIBRARY PROGRAM
1 - List all books
2 - Update a book
3 - Create a new book
4 - Delete a book
5 - Sort all books according to id
6 - Sort all books according to book name
7 - Sort all books according to author name
8 - Exit
Enter your choice : 2


Please enter the record number of the book you want to update : 2

2       Yaban        YakupKadriKaraosmanoglu


1 - Update book name
2 - Update author name
Enter your choice : 1
Enter the new book name : KiralikKonak
2       KiralikKonak      YakupKadriKaraosmanoglu

LIBRARY PROGRAM
1 - List all books
2 - Update a book
3 - Create a new book
4 - Delete a book
5 - Sort all books according to id
6 - Sort all books according to book name
7 - Sort all books according to author name
8 - Exit
Enter your choice : 3


Enter the record number to create a new record : 3
Enter the book name : ArabaSevdasi
Enter the author name : RecaizadeMahmutEkrem

LIBRARY PROGRAM
1 - List all books
2 - Update a book
3 - Create a new book
4 - Delete a book
5 - Sort all books according to id
6 - Sort all books according to book name
7 - Sort all books according to author name
8 - Exit
Enter your choice : 1


Id      Book Name       Author Name
==      ==========      ===========
1       Kasagi          OmerSeyfettin
2       KiralikKonak    YakupKadriKaraosmanoglu
3       ArabaSevdasi    RecaizadeMahmutEkrem


LIBRARY PROGRAM
```

```
        1 - List all books
        2 - Update a book
        3 - Create a new book
        4 - Delete a book
        5 - Sort all books according to id
        6 - Sort all books according to book name
        7 - Sort all books according to author name
        8 - Exit
        Enter your choice : 4

        Enter the record number to delete :  1
        1     Kasagi        OmerSeyfettin
        Deleted.

        LIBRARY PROGRAM
        1 - List all books
        2 - Update a book
        3 - Create a new book
        4 - Delete a book
        5 - Sort all books according to id
        6 - Sort all books according to book name
        7 - Sort all books according to author name
        8 - Exit
        Enter your choice : 6

        Id     Book Name    Author Name
        ==     ==========   ===========
        3      ArabaSevdasi RecaizadeMahmutEkrem
        2      KiralikKonak YakupKadriKaraosmanoglu

        LIBRARY PROGRAM
        1 - List all books
        2 - Update a book
        3 - Create a new book
        4 - Delete a book
        5 - Sort all books according to id
        6 - Sort all books according to book name
        7 - Sort all books according to author name
        8 - Exit
        Enter your choice : 3

        Enter the record number to create a new record : 5
        Enter the book name : Diyet
        Enter the author name : OmerSeyfettin

LIBRARY PROGRAM
        1 - List all books
        2 - Update a book
        3 - Create a new book
        4 - Delete a book
        5 - Sort all books according to id
        6 - Sort all books according to book name
        7 - Sort all books according to author name
        8 - Exit
        Enter your choice : 1

        Id     Book Name     Author Name
```

```
==      ==========   ===========
3       ArabaSevdasi RecaizadeMahmutEkrem
5       Diyet        OmerSeyfettin
2       KiralikKonak YakupKadriKaraosmanoglu

LIBRARY PROGRAM
1 - List all books
2 - Update a book
3 - Create a new book
4 - Delete a book
5 - Sort all books according to id
6 - Sort all books according to book name
7 - Sort all books according to author name
8 - Exit
Enter your choice : 8

Bye...
```

Error Check:

- You are expected to create the text file if it does not exist.
- You have to make sure that your program does not crashes if the user enters an invalid input (e.g., entering integer for name, entering char/string for id).
- Your program should print an error message if user wants to delete or update a nonexistent record.
- Your program should print an error message if user wants to add a record with an existing id.

Notes:

- Write your name, id and at the top line of each submitted file in a commented manner. Ex: //ÖzgürYurtsever, 123456789, HW1Q1.
- WARNING: This homework is an individual assignment. Your programs are checked and compared against each other using automated tools. Any act of cheating will be punished. DO NOT GIVE/TAKE YOUR HOMEWORK TO/FROM OTHERS.