National University of Computer and Emerging Sciences



Lab Manual 12

Programming Fundamentals

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## Objectives

After performing this lab, students shall be able to:

* Have an improved problem-solving ability
* Understanding of filing and STL.

## Note: Implement generic logics.

**Task 1:**

In libraries, there is a LMS (library management system) which holds the record for the staff, members and books of the library.

Following operations will be performed for books.

* A book can only be issued to a member (only if it is available).
* A book can only be added to the library by an admin.
* Each book will have a quantity in the library.
* Each book will have a certain cost if it is damaged when returned by the member.
* Not each book can be issued to the member (ancient books for which library has one copy only).
* The book which can be issued, should be returned in the span of 10 days otherwise member will have to pay the fine.

Following operations will be performed for admin.

* Add a new member.
* Remove an existing member.
* Add/remove a book from library.
* Issue a book to a member (if it is available).
* Collect book from member when returned and fine the member if applicable.
* Login into the system.
* Check the list of members.
* Check the list of books.

Following operations will be performed for member.

* Pay fine.
* Get the book issued.
* Return the book.
* Check his personal details.

Here’s what will be the flow of the LMS.  
It will be asked from the user that who he is (admin/member).

If user is an admin then he will be asked to enter his username and password for logging into the system. After logging in, his list of operations will be shown to him and he will be asked to choose the desired operation.

If the user chooses admin then he will be asked to enter his ID. After matching the ID from the record, his operations will be shown to him and he will be asked to choose the desired operation.  
  
Here are the things to be kept in concern for this system.

* Maintain files for the data of books, admin (login information) and members of the library. Also you will need to maintain a file for the issued books with the issued dates as well.
* Each member will have a unique ID so it will be easy to differentiate members on the basis of their IDs. Moreover, the books will also have the IDs as well.
* As this system’s record/data can be changed anytime (operations can be performed on the data) so try to read the data from files first and then manage it using vectors.
* Update the data in the files after any operation has been performed.
* Don’t quit the program if the user has performed the operation, in fact ask the user if he wants to perform more operations or not.
* Before ending the program, make sure to re-write the data from vectors to the files. This is how we can keep our system updated.
* Perform each operation in a function.
* Do not let multiple users/multiple books have the same ID.
* Submit all files with the code.