IT 206
Data structure Lab
Project report

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Problem statement:

During this corona virus(pandemic), we cannot go to the library, so there is a need to make an online management system for a local library.

Approach:

We made a library system, where a user can make a new account, log in, loan a book, return a book.

Functions:

1. Create an account.
2. Login using an account.
3. Review your account (details).
4. Loan a book.
5. Return a book.
6. Suggesting book (for library).
7. Log out.

Implementation:

To accomplish the user information and searching the username to log in and move to the further functions, we used hashing with separate chaining (to avoid collision) and execute the function in as less time as possible.
This application also makes use of arrays, linked list and Object-Oriented Programming (OOP).

Function description:

1. **Creating an account**:

   This is the first function which needs to be executed (of course, after the main() function), this function takes a string as an input from user for username and password. Checks if the (HashMap's) array is empty (at the i=hash_function() place) and if it is not empty then it uses the separate Channing to avoid collision.

2. **Log in function:**

   This function takes username as input from the user to "log in", searches the username, asks for password (gives 5 chances if the password was wrong). Searching of the username is done with the help of HashMap.

3. **Review account's details:**

   Shows the account details only if the user is logged in.

   Account details include:

   a. Username

   b. Book's name (if on loan).

4. **Loan a book:**
   Takes book and username name as input, searches and checks if the book is available and free, if the book is free, loan confirmed.
5. **Return a book:**
   Takes username as input, if the username has a book on loan, confirms if the user wants to return the book, returns the book.
6. **Suggesting book:**
   Any user can use this function to suggest the book, if it is not available in the library. Takes string as an input, and places it in the “book names” HashMap.
7. **Log out:**
   Takes username as input, checks if already logged in, log outs the user.

Learnings:

We made a strong grip on hashing, (single) linked list and how to handle code of big size. (>500 lines)

Limitations:

We could have used file handling to pre load the library’s detail.