

Test Suite Document

for

LIBRARY INFORMATION SYSTEM

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Member Login()

- Member Logs in successfully

Input :

- MemberID : UG_2022_00001
- Password : ...(Password Encrypted)

MEMBERS table :

MemberID	Name	Email ID	Password	Reserved Book	Reminder	Currently Issued Books	Limit	Book Issue Duration
PG2022_00011	PG1	pg1@gmail.com	...(Password Encrypted)	(NULL)	(NULL)	(NULL)	4	1

Fig. Data entry in the Members data-table corresponding to the MemberID added

Output:

- A LibraryMember Object
- (MemberID : "UG_2022_00001"; Name: "Random")

- Member ID not present in Members section

Input :

- MemberID : UG_2022_00001
- Password : ...(Password Encrypted)

MEMBERS table :

MemberID	Name	Email ID	Password	Reserved Book	Reminder	Currently Issued Books	Limit	Book Issue Duration
PG2022_00011	PG1	pg1@gmail.com	...(Password Encrypted)	(NULL)	(NULL)	(NULL)	4	1

Fig. Data entry in the Members data-table corresponding to the MemberID added

Output :

- Exception Thrown: MemberIDInvalid: "The MemberID is not present in the system."
- Message to the User: "Invalid MemberID inputted."

- Password entered does not match with the Member ID

Input :

- MemberID : UG_2022_00001
- Password : ...(Password Encrypted)

MEMBERS table :

MemberID	Name	Email ID	Password	Reserved Book	Reminder	Currently Issued Books	Limit	Book Issue Duration
PG2022_00011	PG1	pg1@gmail.com	...(Password Encrypted)	(NULL)	(NULL)	(NULL)	4	1

Fig. Data entry in the Members data-table corresponding to the MemberID added

Output :

- Exception Thrown: PasswordIncorrect: "The Password is incorrect."
- Message to the User: "Password is incorrect."

Employee Login()

- Employee logs in successfully

Input :

- EmployeeID: LIB001
- Password: ...(Password Encrypted)

EMPLOYEES table :

EmployeeID	EmployeeName	Password
"LIB001"	"Jones"	...(Password Encrypted)

Output :

- An Librarian Object (EmployeeID: "LIB001"; Name: "Jones")

- **Employee ID not present in Employees section**

Input :

- EmployeeID : LIB001
- Password : ...(Password Encrypted)

EMPLOYEES table :

EmployeeID	EmployeeName	Password
"LIB001"	"Jones"	...(Password Encrypted)

Output :

- Exception Thrown: EmployeeIDInvalid: "The EmployeeID is not present in the system."
- Message to the User: "Invalid EmployeeID inputted."

- **Password entered does not match with the Employee ID**

Input :

- EmployeeID : LIB001
- Password : ...(Password Encrypted)

EMPLOYEES table :

EmployeeID	EmployeeName	Password
"LIB001"	"Jones"	...(Password Encrypted)

Output :

- Exception Thrown: PasswordIncorrect: "The Password is incorrect."
- Message to the User: "Password is incorrect."

Library Member()

- Test Getter Functions:

Input :

- A LibraryMember object (name: Random; MemberID: UG2022_00001)

MemberID	Name	Email ID	Password	Reserved Book	Reminder	Currently Issued Books	Limit	Book Issue Duration
PG2022_00011	PG1	pg1@gmail.com	...(Password Encrypted)	(NULL)	(NULL)	(NULL)	4	1

Fig. The Library member object from the Members data table for which getter functions tested

Output :

- *Getting the Member ID of the Member :-*
 - Output: UG2022_00001
- *Getting the Name of the Member :-*
 - Output: Random
- *Getting the list of currently issued books by the Member :-*
 - Output: (NULL)

- *Getting the information of currently reserved book by Member :-*
 - Output : (NULL)
- *Getting the information of reminders sent to the Member :-*
 - Output: (NULL)

- **Test CheckAvailabilityOfBook():**

Input:

- A Book object whose availability is to be checked by the Member

ISBN	Title	Author	Reservation List	Rack No.	Date Added	Issue Status
978-3-16-148410-4	MyBook	Author	(NULL)	B-121	"12-05-1998"	"23-07-2022"

Fig. The data entry of the book object for which the member wishes to check availability

Output :

- If Issue Status column has value (NULL): Book is available to be issued by any member
- If Issue Status column has a date: Book is not available as it is currently issued by some other Member

- **Test CanIssue():**

If the Member has not exceeded his maximum book issue limit at the current instance

Input:

A LibraryMember object (MemberID: PG2022_00011, Name: PG1;)

MemberID	Name	Email ID	Password	Reserved Book	Reminder	Currently Issued Books	Limit	Book Issue Duration
PG2022_00011	PG1	pg1@gmail.com	...(Password Encrypted)	(NULL)	(NULL)	(NULL)	4	1

Fig. Member object of MemberID: PG2022_00011 showing NULL in Currently Issued Books, so he can issue a new book

Output:

True

Since the Currently Issued Books column of the given LibraryMember shows NULL(0 books issued), she can issue a book as her max limit of 4 books at a time is still not reached.

If the Member has exceeded his maximum book issue limit at the current instance

Input:

A LibraryMember object (MemberID: PG2022_00011, Name: PG1;)

MemberID	Name	Email ID	Password	Reserved Book	Reminder	Currently Issued Books	Limit	Book Issue Duration
PG2022_00011	PG1	pg1@gmail.com	...(Password Encrypted)	(NULL)	(NULL)	MyBook, Book1, Book2, Book3	4	1

Fig. Member object of MemberID: PG2022_00011 showing 4 books in Currently Issued Books, so he can't issue a new book

Output:

False

Since the Currently Issued Books column of the given LibraryMember shows 4 books issued currently, she can't issue any other book as her max limit of 4 books at any given instance of time is reached.

- **Test IssueBook():**

Input:

- A LibraryMember object
- A Book object

MemberID	Name	Email ID	Password	Reserved Book	Reminder	Currently Issued Books	Limit	Book Issue Duration
PG2022_00011	PG1	pg1@gmail.com	...(Password Encrypted)	(NULL)	(NULL)	MyBook	4	1

Fig. Member object of MemberID: PG2022_00011 showing 1 book in Currently Issued Books, so he can issue a new book

ISBN	Title	Author	Reservation List	Rack No.	Date Added	Issue Status
978-3-16-148410-4	MyBook	Author	(NULL)	B-121	"12-05-1998"	""

Fig. The data entry of the book Mybook which the member PG1 wants to issue shows Issue Status as "" (NULL), so this book is currently not issued by anyone and hence can be issued by PG1

Output:

Since the issue status of the book to be issued shows " " (NULL), and the Member has not exceeded his Max Issue Limit, the issue request is sent to the portal and can be approved by a Library Clerk, after which the corresponding databases will be updated and the book will be issued to the Member.

● Test ReserveBook():

If the user has already reserved a book and wishes to reserve another book.

Input :

- A LibraryMember object

MemberID	Name	Email ID	Password	Reserved Book	Reminder	Currently Issued Books	Limit	Book Issue Duration
PG2022_00011	PG1	pg1@gmail.com	...(Password Encrypted)	Book2	(NULL)	(NULL)	4	1

Fig. Library Member PG1 has a book already reserved, and since 1 user can reserve only 1 book at a time, he can't reserve another book

Output :

- The user already has a book currently reserved for herself -> deny reservation

If the user has not reserved any book and is eligible to reserve a book.

Input:

- A LibraryMember object
- A Book object

MemberID	Name	Email ID	Password	Reserved Book	Reminder	Currently Issued Books	Limit	Book Issue Duration
PG2022_00011	PG1	pg1@gmail.com	...(Password Encrypted)	(NULL)	(NULL)	MyBook	4	1

Fig. Library Member PG1 has a book already reserved, and since 1 user can reserve only 1 book at a time, he can't reserve another book

ISBN	Title	Author	Reservation List	Rack No.	Date Added	Issue Status
978-3-16-148410-4	MyBook	Author	(NULL)	B-121	"12-05-1998"	"23-07-2022"

Outputs:

- The user has no book reserved from before -> book reserved for the user

• Test ReturnBook():

Input:

- A LibraryMember object (shows MyBook in the Currently issued books column)
- A Book object (MyBook)

MemberID	Name	Email ID	Password	Reserved Book	Reminder	Currently Issued Books	Limit	Book Issue Duration
PG2022_00011	PG1	pg1@gmail.com	...(Password Encrypted)	(NULL)	(NULL)	MyBook	4	1

ISBN	Title	Author	Reservation List	Rack No.	Date Added	Issue Status
978-3-16-148410-4	MyBook	Author	(NULL)	B-121	"12-05-1998"	"23-07-2022"

Output :

Return request is sent to portal and can be approved by a Library Clerk from the portal on visual inspection of the book in the presence of the Issuer in the Library

- **Test CheckForReminders():**

Input :

A LibraryMember object

MemberID	Name	Email ID	Password	Reserved Book	Reminder	Currently Issued Books	Limit	Book Issue Duration
PG2022_00011	PG1	pg1@gmail.com	...(Password Encrypted)	(NULL)	P_200_Book1,R_Book2	(NULL)	4	1

Output :

Shows all the notifications and reminders to the member. In the above example, the Member has 2 new reminders:

(1) “P_200_Book1” will display on the User Interface for member PG1 the message “Penalty of Rs. 200 due for late return of the Book “Book_1.”

(2) “R_Book2” will display the message “You have an active reservation for the book Book2. Please issue it before the active reservation expires.”

Library Clerk()

- **Test AddBook():**

If the added book has an ISBN number that already exists in the database (case in which we are adding copies of an already existing book):

Input:

- Book ISBN: 978-3-16-148410-9
- Book Title: Book_2, Author: Author2
- Rack Number: F-964
- DateAdded: “08-12-2020”
- IssueStaus: “”(NULL)
- Books data table before adding the book

ISBN	Title	Author	Reservation List	Rack No.	Date Added	Issue Status
978-3-16-148410-4	MyBook	Author	(NULL)	B-121	"12-05-1998"	"23-09-2022"
978-3-16-148410-0	GoodBook	Author1	(NULL)	C-334	"21-06-2005"	""
978-3-16-148410-0	GoodBook	Author1	(NULL)	C-334	"21-06-2005"	"12-09-2022"
978-3-16-148410-9	Book_2	Author2	(NULL)	F-964	"03-12-2020"	""
978-3-16-148410-6	Book_3	Author3	(NULL)	H-232	"31-12-2021"	""

Fig. Books data table before the given book with same ISBN as Book_2 is added

Output:

The book is added in the Books data table next to the book with the same ISBN and is basically a copy of the same book. Thus, the Books data table has separate rows for the copies of a book (same ISBN) and the Books are stored such that all same ISBN Book entries are consecutive.

ISBN	Title	Author	Reservation List	Rack No.	Date Added	Issue Status
978-3-16-148410-4	MyBook	Author	(NULL)	B-121	"12-05-1998"	"23-09-2022"
978-3-16-148410-0	GoodBook	Author1	(NULL)	C-334	"21-06-2005"	""
978-3-16-148410-0	GoodBook	Author1	(NULL)	C-334	"21-06-2005"	"12-09-2022"
978-3-16-148410-9	Book_2	Author2	(NULL)	F-964	"03-12-2020"	""
978-3-16-148410-9	Book_2	Author2	(NULL)	F-964	"08-12-2020"	""
978-3-16-148410-6	Book_3	Author3	(NULL)	H-232	"03-12-2020"	""

Fig. Books data table after the given book with same ISBN as Book_2 is added

If the added book has an ISBN number that doesn't exist exists in the database (case in which we are adding a new book):

Input:

- Book ISBN: 978-3-16-148410-9
- Book Title: Book_2, Author: Author2
- Rack Number: F-964
- DateAdded: "08-12-2020"
- IssueStaus: ""(NULL)
- Books data table before adding the book

ISBN	Title	Author	Reservation List	Rack No.	Date Added	Issue Status
978-3-16-148410-4	MyBook	Author	(NULL)	B-121	"12-05-1998"	"23-09-2022"
978-3-16-148410-0	GoodBook	Author1	(NULL)	C-334	"21-06-2005"	""
978-3-16-148410-0	GoodBook	Author1	(NULL)	C-334	"21-06-2005"	"12-09-2022"
978-3-16-148410-9	Book_2	Author2	(NULL)	F-964	"03-12-2020"	""

Fig. Books data table before the book Book_3 with a new ISBN is added

ISBN	Title	Author	Reservation List	Rack No.	Date Added	Issue Status
978-3-16-148410-4	MyBook	Author	(NULL)	B-121	"12-05-1998"	"23-09-2022"
978-3-16-148410-0	GoodBook	Author1	(NULL)	C-334	"21-06-2005"	""
978-3-16-148410-0	GoodBook	Author1	(NULL)	C-334	"21-06-2005"	"12-09-2022"
978-3-16-148410-9	Book_2	Author2	(NULL)	F-964	"03-12-2020"	""
978-3-16-148410-6	Book_3	Author3	(NULL)	H-232	"31-12-2021"	""

Fig. Books data table after the book Book_3 with a new ISBN is added

Output:

The book is added in the Books data table in a new row

• Test ApproveIssue():

Input:

- Issue Request
- Member object who has sent Issue Request
- Book object for which Issue Request is sent

MemberID	Name	Email ID	Password	Reserved Book	Reminder	Currently Issued Books	Limit	Book Issue Duration
PG2022_00011	PG1	pg1@gmail.com	...(Password Encrypted)	(NULL)	(NULL)	(NULL)	4	1

Fig. The member PG1 has no book issued at present, so he can issue books

ISBN	Title	Author	Reservation List	Rack No.	Date Added	Issue Status
978-3-16-148410-4	MyBook	Author	(NULL)	B-121	"12-05-1998"	""

Fig. The book MyBook is currently not issued to any member as its issue Status is "" (NULL)

Output:

- The clerk approves the issue request and it is notified to the member.
- The corresponding data entries for the member PG1 is updated to show "MyBook" in Currently Issued Books. The Issue Status of the book is changed from "" (NULL) to the date "23-07-2022" on which the Issue Request was approved.

ISBN	Title	Author	Reservation List	Rack No.	Date Added	Issue Status
978-3-16-148410-4	MyBook	Author	(NULL)	B-121	"12-05-1998"	"23-07-2022"

MemberID	Name	Email ID	Password	Reserved Book	Reminder	Currently Issued Books	Limit	Book Issue Duration
PG2022_00011	PG1	pg1@gmail.com	...(Password Encrypted)	MyBook	(NULL)	MyBook	4	1

- **Test ApproveReturn():**

Input:

- Member object
- Book object

MemberID	Name	Email ID	Password	Reserved Book	Reminder	Currently Issued Books	Limit	Book Issue Duration
PG2022_00011	PG1	pg1@gmail.com	...(Password Encrypted)	MyBook	(NULL)	MyBook	4	1

ISBN	Title	Author	Reservation List	Rack No.	Date Added	Issue Status
978-3-16-148410-4	MyBook	Author	(NULL)	B-121	"12-05-1998"	"23-07-2022"

Output:

The clerk approves the return request and it is notified to the member.

MemberID	Name	Email ID	Password	Reserved Book	Reminder	Currently Issued Books	Limit	Book Issue Duration
PG2022_00011	PG1	pg1@gmail.com	...(Password Encrypted)	(NULL)	(NULL)	(NULL)	4	1

ISBN	Title	Author	Reservation List	Rack No.	Date Added	Issue Status
978-3-16-148410-4	MyBook	Author	(NULL)	B-121	"12-05-1998"	""

Librarian()

- **Test AddMember():**

If the new member added is not present in the database:

Input:

- MemberID: UG2022_00124
- MemberName: UG2
- Email ID: ug2@gmail.com
- Password:(Password Encrypted)
- Members data table

MemberID	Name	Email ID	Password	Reserved Book	Reminder	Currently Issued Books	Limit	Book Issue Duration
PG2022_00011	PG1	pg1@gmail.com	...(Password Encrypted)	(NULL)	(NULL)	(NULL)	4	1
RS2021_00122	RS1	rs1@gmail.com	...(Password Encrypted)	(NULL)	(NULL)	(NULL)	6	3
UG2022_00001	UG1	ug1@gmail.com	...(Password Encrypted)	(NULL)	(NULL)	(NULL)	2	1

Fig. Members data table with initial member entries before the new member is added

MemberID	Name	Email ID	Password	Reserved Book	Reminder	Currently Issued Books	Limit	Book Issue Duration
PG2022_00011	PG1	pg1@gmail.com	...(Password Encrypted)	(NULL)	(NULL)	(NULL)	4	1
RS2021_00122	RS1	rs1@gmail.com	...(Password Encrypted)	(NULL)	(NULL)	(NULL)	6	3
UG2022_00001	UG1	ug1@gmail.com	...(Password Encrypted)	(NULL)	(NULL)	(NULL)	2	1
UG2022_00124	UG2	ug2@gmail.com	...(Password Encrypted)	(NULL)	(NULL)	(NULL)	2	1

Fig. Members data table once a new member is added.

Output:

- Member added to the database

If the new member added is already present in the database:

Input:

- MemberID: UG2022_00124
- MemberName: UG2
- Email ID: ug2@gmail.com
- Password:(Password Encrypted)

MEMBERS data table

MemberID	Name	Email ID	Password	Reserved Book	Reminder	Currently Issued Books	Limit	Book Issue Duration
PG2022_00011	PG1	pg1@gmail.com	...(Password Encrypted)	(NULL)	(NULL)	(NULL)	4	1
RS2021_00122	RS1	rs1@gmail.com	...(Password Encrypted)	(NULL)	(NULL)	(NULL)	6	3
UG2022_00001	UG1	ug1@gmail.com	...(Password Encrypted)	(NULL)	(NULL)	(NULL)	2	1

Fig. Members data table with initial member entries before the new member is added

Output:

- Exception Thrown: The member being added is already registered. Message to the user "The given details correspond to an existing member."

MemberID	Name	Email ID	Password	Reserved Book	Reminder	Currently Issued Books	Limit	Book Issue Duration
PG2022_00011	PG1	pg1@gmail.com	...(Password Encrypted)	(NULL)	(NULL)	(NULL)	4	1
RS2021_00122	RS1	rs1@gmail.com	...(Password Encrypted)	(NULL)	(NULL)	(NULL)	6	3
UG2022_00001	UG1	ug1@gmail.com	...(Password Encrypted)	(NULL)	(NULL)	(NULL)	2	1

Fig. Members data table remains unchanged as the new member we are trying to add already exists

- Test DeleteMember():

If the member to be deleted has no overdue/unreturned books

Input:

LibraryMember object to be deleted (entry corresponding to the member named "UG2" with MemberID UG2022_00124

MemberID	Name	Email ID	Password	Reserved Book	Reminder	Currently Issued Books	Limit	Book Issue Duration
PG2022_00011	PG1	pg1@gmail.com	...(Password Encrypted)	(NULL)	(NULL)	(NULL)	4	1
RS2021_00122	RS1	rs1@gmail.com	...(Password Encrypted)	(NULL)	(NULL)	(NULL)	6	3
UG2022_00001	UG1	ug1@gmail.com	...(Password Encrypted)	(NULL)	(NULL)	(NULL)	2	1
UG2022_00124	UG2	ug2@gmail.com	...(Password Encrypted)	(NULL)	(NULL)	(NULL)	2	1

Fig. Members data table before the deletion of the member

Output:

The member which is present in the database and has no overdue/unreturned book is deleted successfully.

MemberID	Name	Email ID	Password	Reserved Book	Reminder	Currently Issued Books	Limit	Book Issue Duration
PG2022_00011	PG1	pg1@gmail.com	...(Password Encrypted)	(NULL)	(NULL)	(NULL)	4	1
RS2021_00122	RS1	rs1@gmail.com	...(Password Encrypted)	(NULL)	(NULL)	(NULL)	6	3
UG2022_00001	UG1	ug1@gmail.com	...(Password Encrypted)	(NULL)	(NULL)	(NULL)	2	1

Fig. Members data table with the Member with ID UG2022_00124 deleted.

If the member to be deleted has overdue/unreturned books or uncleared penalties, a warning message will be shown on the UI to the Librarian, further asking for confirmation if the Librarian still wants to proceed further with the deletion.

Book()

- **Test Getter Functions:**

Input:

A Book object:

ISBN	Title	Author	Reservation List	Rack No.	Date Added	Issue Status
9876543210	MyBook	Author@gmail.com	(NULL)	B-121	"12-05-1998"	"23-05-2002"

Output :

- GetBookISBN -> 9876543210
- GetBookTitle -> MyBook
- GetBookAuthor -> Author@gmail.com
- GetRackNumber -> B-121
- GetIssueStatus -> "23-05-2002"
- GetReservationList -> (NULL)
- GetDateAdded -> "12-05-1998"