

Systems Operations and Operation Contracts

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1 System operations:

- IsUserRegistered()
- RegisterUser()
- LoginUser()
- CheckoutBook()
- ReturnBook ()
- SerarchBook()
- AddBook()
- IsAdmin()
- AddNewAdmin()
- RegisterPayment()
- ProcessPayment()
- IsOverdue()

2 Operations Contracts:

- Contract: Register User
 - Scope: Single user interaction
 - Primary Actor: New student or user
 - stakeholders:
 - * New student
 - * Librarian or Management
 - Operation: Register User(User user)
 - Pre-conditions: A new user is attempting to use the library
 - Post-conditions:
 - * A new user instance has been added to the DB

- Contract: Login User
 - Scope: Single user interaction
 - Primary Actor: New student or user
 - stakeholders:
 - * Student
 - Operation: Login User(User user)
 - Pre-conditions: An established user is logging in with secure credentials.
 - Post-conditions:
 - * The user has authenticated into the system
 - * The user has access to functionality attached to a user account.
 - * The user established a line of payment for overdue books as initial account setup

- Contract: Checkout Book
 - Scope: Single user
 - Primary Actor: Single Student or user
 - stakeholders:
 - * Student
 - * Librarian
 - Operation: CheckoutBook(User user Book book)
 - Pre-conditions: An established user who is logged in checks out a book that is in the library
 - Post-conditions:
 - * The user has checked out the book
 - * The book is tracked as being checked out by the user
 - * The Librarian was present and approved the checkout of the book
 - * A return date has been established

- Contract: Return Book
 - Scope: Single user
 - Primary Actor: Single Student or user
 - stakeholders:
 - * Student
 - * Librarian
 - Operation: Return(User user, Book book)
 - Pre-conditions: An established user who is logged in returns a valid book that was checked out correctly
 - Post-conditions:
 - * The user has returned the book
 - * The book is tracked as returned and inventory is updated
 - * Any late fees have begun to be processed
 - * The return date is cleared and no new fees accrue.

- Contract: Add New Book
 - Scope: Single Librarian
 - Primary Actor: Single Librarian or admin staff
 - stakeholders:
 - * Librarian
 - Operation: AddBook(User user, Book book)
 - Pre-conditions: An established staff member adds a new book to inventory that fulfills the basic book requirements.
 - Post-conditions:
 - * The book has been added to the inventory
 - * The book has a valid Id that is tracked
 - * The book appears in inventory lists for students to see
 - * The book can be checked out.

- Contract: Process Payment
 - Scope: Single User
 - Primary Actor: Single user or student
 - stakeholders:
 - * Student
 - * Librarian
 - Operation: Process Payment(User user, Book book)
 - Pre-conditions: An established user with a valid form of payment has not returned a book on the due date.
 - Post-conditions:
 - * The book is not listed in inventory by the due date
 - * The book has been tracked to a registered students id
 - * The payment has been processed for the correct amount
 - * The student has been notified a payment has begun.

- Contract: Add New Admin
 - Scope: Library Management
 - Primary Actor: New Admin and trainer
 - stakeholders:
 - * New Librarian
 - * Established Librarian
 - Operation: AddNewAdmin(User user)
 - Pre-conditions: An established user who has been hired as an admin and approved to work as an admin in the system.
 - Post-conditions:
 - * The user has been updated from STUDENT to ADMIN
 - * The user has full admin access to the Library system appropriate to their role
 - * The user training them ahs overseen and approved all transactions to grant admin access