

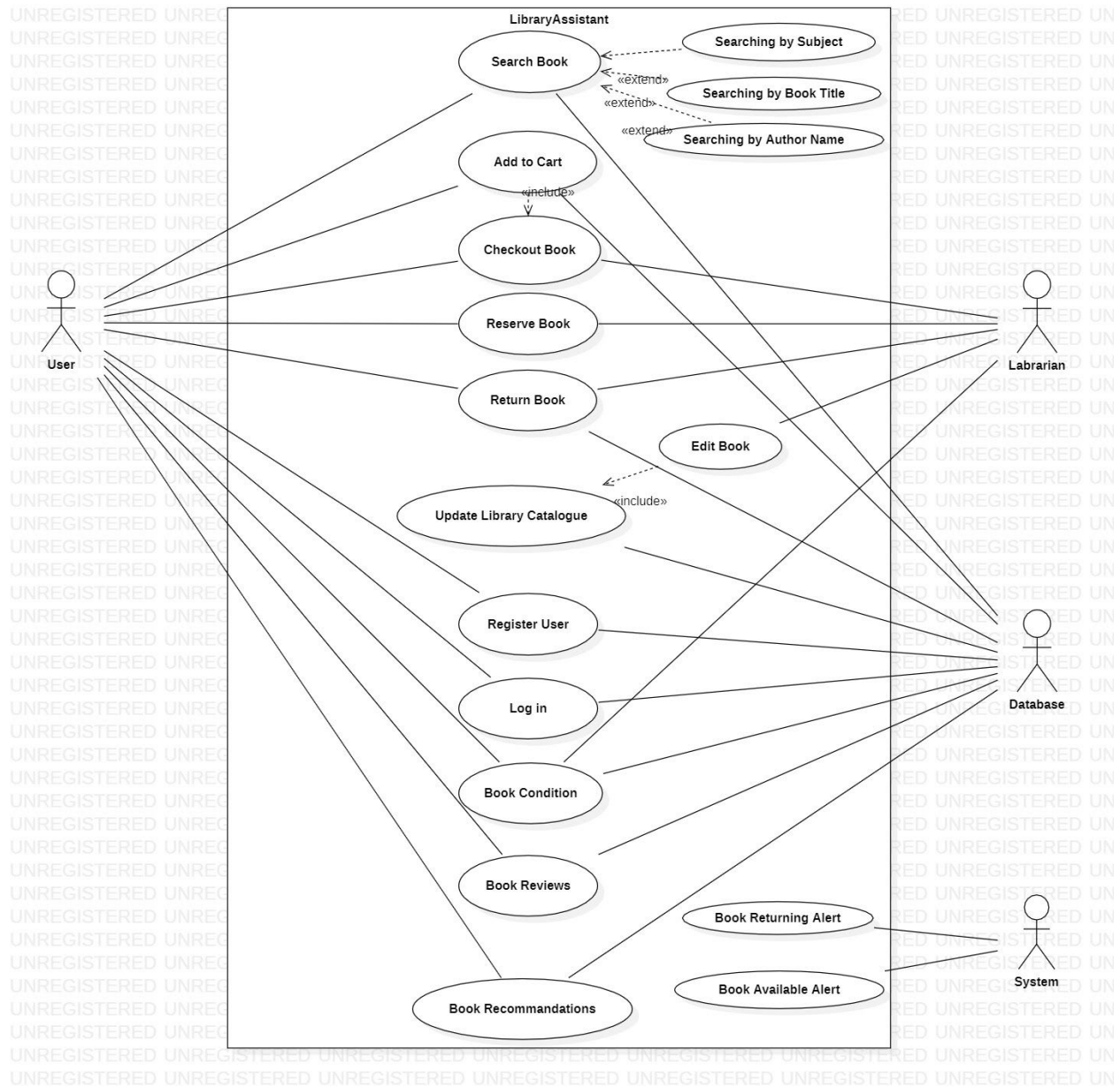
# CptS 583 Software Quality

Spring 2021

## Project Deliverable 1-2

LA583

1. Requirements:
  - a. Use Case Diagram:



b. Use Case Elaboration:

Use Case	Register Account
Actors	User and Database
Goal	Add a new user to database
Preconditions	User ID does not exist
Scenarios	User provides information Account is created
Exceptions	Unique User ID

Use Case	Login
Actors	User, Librarian and Database
Goal	Login to the portal of the library
Preconditions	User or Librarian has an account
Scenarios	Providing account information (username and password)
Exceptions	Incorrect username or password or both of them

Use Case	Search Book
Actors	User, Librarian and Database
Goal	Searching for books in the library
Preconditions	User has keywords to search books
Scenarios	User is interested in either book categories, Authors, or a certain book
Exceptions	User does not find a book

Use Case	Reserve Book
Actors	User and the database

Goal	User can put a book on hold
Preconditions	The user is a registered user. The book is not already on hold for another user.
Scenarios	The user search for a book and want to reserve it so they can pick it on their next visit
Exceptions	User has too many books checked out and cannot reserve another book, not a registered user

Use Case	Checkout Book
Actors	User, Librarian, and Database
Goal	Checkout a book
Preconditions	Book is in stock
Scenarios	User is a registered member and the library has a book in stock they want to read
Exceptions	Not in stock or not a registered member

Use Case	Return Book
Actors	User, Librarian, and Database
Goal	Return to the library
Preconditions	Book was checked out and is being returned
Scenarios	User wants to return a checked out book to the library
Exceptions	Not a valid member

Use Case	Update Library Catalogue
Actors	Librarian, Database
Goal	Add or remove a book
Preconditions	Librarian got a book and needs to update the status in the catalogue

Scenarios	The librarian can add a book, remove a book, or update information about it
Exceptions	There is no exception

Use Case	Book Returning Alert
Actors	System
Goal	Alert to user have to return a book to library
Preconditions	User checked out a book
Scenarios	The limit of book check out time is almost up
Exceptions	There is no exception

Use Case	Book Available Alert
Actors	System
Goal	Alert the user that a book they reserved is available
Preconditions	Book is available and the user reserved the book
Scenarios	The book is available and the system sends an alert to the user that reserved the book
Exceptions	The user has overdue books

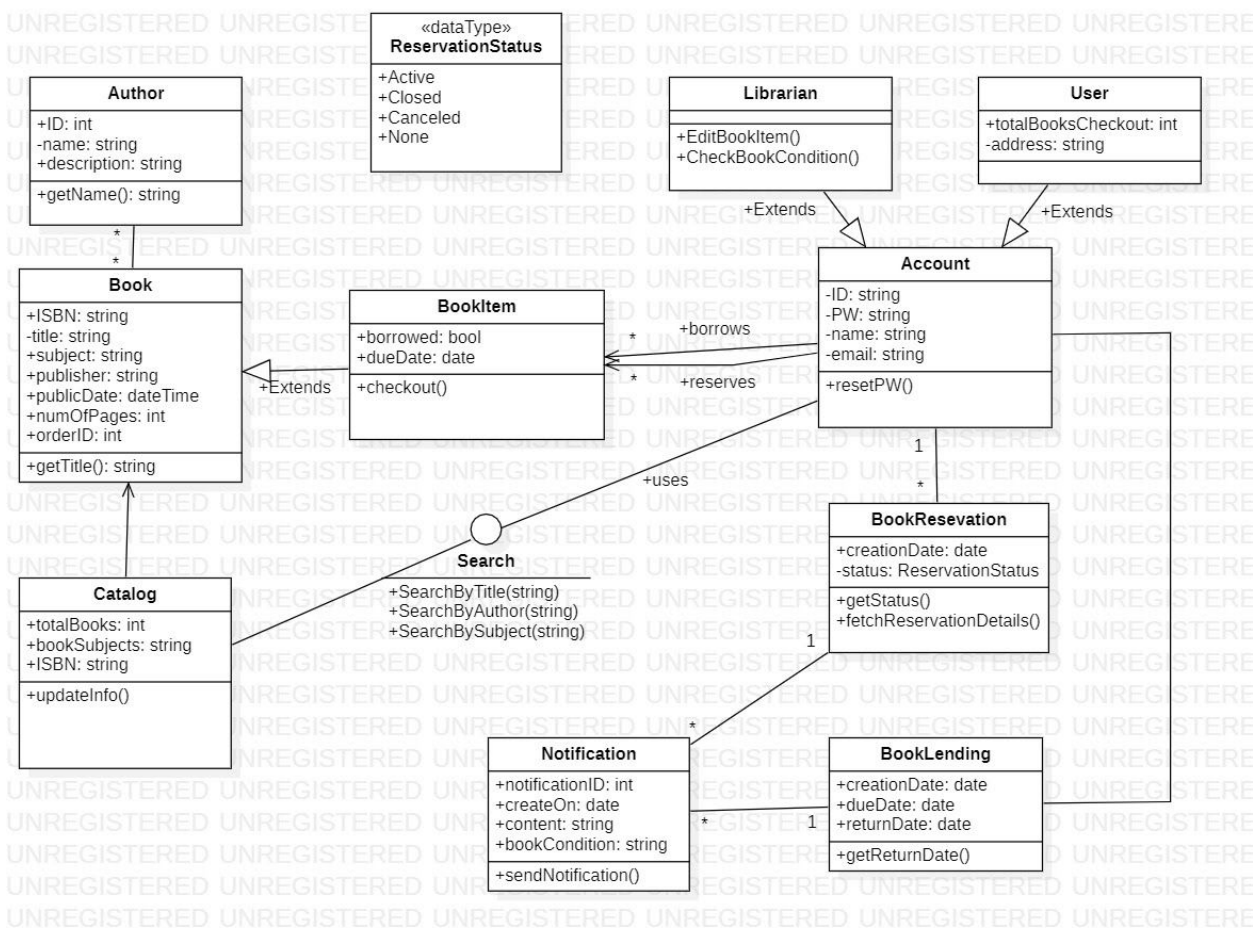
Use Case	Book Recommendation
Actors	Database
Goal	Recommend books to user based on their history
Preconditions	User is a registered user, must have a search/borrowed history. Recommended book is available
Scenarios	The user isn't sure of a book they would like, the system can send a list of recommendations
Exceptions	User is not a registered user, user has a fine

Use Case	Book Review
Actors	User
Goal	For the user to leave a review
Preconditions	User is a registered member and the book exists
Scenarios	User leaves their thoughts and opinions about the book
Exceptions	Non existent book or the user is not registered

Use Case	Book Condition
Actors	Librarian
Goal	Librarian determines book condition
Preconditions	Books are available or returned
Scenarios	When the librarian give or receive a book, he/she checks the book's condition and mark the result into the condition checking list
Exceptions	There is no exception

Use Case	Add To Cart
Actors	User and Database
Goal	User adds a book to their cart
Preconditions	User is a registered member and the book is existent
Scenarios	User is interested in a book
Exceptions	User is not registered or book is not available

c. UML Class Diagram:



2. Quality Plan:

a. Quality Goals and Metrics:

Product Quality	Quality Goals	Quality metrics	Strategy
Availability	The system shall be always accessible	System availability should be 99.9%	Microsoft Azure service
Reliability	The system shall always be in working order	The system error occurrences should be less than 2%	Code review, Testing tool
Robustness	The system	Should not return	Robustness

	should be able to accept any appropriate user inputs	any errors with appropriate inputs	testing by variety of languages' and special symbols' input
Learnability	The system shouldn't be too complicated and easy to learn.	The user should be able to fully navigate the system within an hour	Usability test
Usability	The system should be simple to use	The system should be straightforward with a simple interface	Usability test
Efficiency	The system should respond to user inputs in a timely manner	The system should return search immediately	SQL test, Code review, Testing tools
Security	The system should be safe and secure for user information	User data cannot be accessed by someone else, even the librarian. User password will be encrypted.	SQL test, Testing tools
Portability	The system should work with any database	The system should work with modern databases	SQL test(Test on multiple database)
<b>Process Quality</b>			
Maintainability	The system should not be complex to maintain	The source code should not include code smells,	Code Review
Testability	The system	Every class within	Testing tools

	should be in a good environment for testing.	the system should have both black and white box testing	
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b. Priority of Quality Goals:

1. Availability, Security and Reliability
2. Efficiency, Learnability, Robustness and Usability
3. Maintainability and Testability
4. Portability

c. Costs Of The Quality:

Task Name	Estimated Effort (hrs)	Implementation	Evaluation	Prevention	Rework
Project Planning	30	28	0	0	2
Infrastructure setup	5	4	0	0	1
UI Design	16	12	2	0	2
Initial Project development and Unit Testing	44	32	4	4	4
Quality Assurance - Integration/E 2E testing	20	10	5	5	0
Acceptance Testing	10	4	4	2	0
Software Bug Correction	20	10	0	0	10
Total	145	100	15	11	19



# References

[1] "Design a Library Management System," [Online]. Available: <https://www.educative.io/courses/grokking-the-object-oriented-design-interview/RMIM3NgjAyR>. [Accessed 04 February 2021].

[2] "SLA summary for Azure services," [Online]. Available: <https://azure.microsoft.com/en-us/support/legal/sla/summary/>