GSU Books Shopping System

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Revision History

Version	Date	Details	Author
1.0	January 21, 2017	Initial Version. Includes team members, deliverable milestones, introduction, project organization summary and monitoring and controlling mechanism details.	B. Her
1.1	February 6, 2017	Included glossary for acronyms. Functional Requirements expressed using "shall" statements. RTM with Use Cases. Updated work structure, and a Gantt chart that allocates task completed to this current stage of project.	B.Her
1.2	February 21, 2017	Includes horizontal prototype. Update RTM with the fifth column. Use Case diagram and rationale. Function Point Analysis. Database used for system. Updated Gantt Chart.	B.Her
1.3	February 28, 2017	Includes updated horizontal prototype. Updated RTM with the fifth column. Update Use Case diagram and rationale. Software Architecture. Collaboration Interaction Chart. Facade Object Diagram. Updated Gantt Chart and WSD.	B.Her
1.4	March 8, 2017	Includes updated WSD, RTM, and Gantt Chart. Object Class CID included. All rationale in one segment. Updated object rationale, and dictionary terms.	B.Her
1.5	March 26, 2017	Includes updated WSD, Gantt Chart, COCOMO, Test Cases, and Test Cases rationale.	B.Her
1.6	April 24, 2017	Includes Introduction, Object Design,FTP and COCOMO Conclusion,, All Test Cases, Project Legacy, updated WSD, RTM, and Gantt Chart.	B.Her

Georgia State University

CSC 4350 - Software Engineering   Spring 2017

Table of Contents

Purpose of this document

This document explains the requirement elicitations, and using scenarios to showcase the interaction between the user and the system. Also, the document projects the expected time of completion for certain tasks represented by the Requirements Traceability Matrix (RTM).

Audience

The audiences for the requirement elicitations would include a Georgia State University (GSU) student as the user. The first half of this document, details the use cases and nonfunctional requirements.

1   Introduction

Team Unity's goal is to build a GSU Books (GSUB) shopping system that services to the well-being of GSU students, providing an optimal alternative option in mitigating their spendings, by exponentially reducing the costs of textbooks. GSUB shopping system is a web base application for GSU students to purchase books at a discounted rate. The user can navigate and browse through the system contents, looking for particular books to purchase. When user decides upon the book of interest, he/she shall make a login account with GSUB before purchasing.

1.1   Purpose

The purpose of the GSUB system is to help GSU students save money on textbooks, at a reduced cost.

1.2   Scope of the System

The scope of the GSUB starts when the user opens the application while connected to the Internet.

1.3   Objectives and Success Criteria of the Project

When user creates a login account with GSUB and purchases a book, GSUB will store their account information and purchase history.

1.4   Acronym Glossary

GSU	Georgia State University
GSUB	Georgia State University Books
ISBN	International Book Standard Number
RTM	Required Traceability Matrix

SW	Software
MVC	Model View Controller
WSD	Work Structure Document
CID	Category Interaction Diagram
KLOC	Line of Code (in thousands)
IDE	Integrated Development Environment
VCS	Version Control System
SQL	Structured Query Language
GUI	Graphic User Interface
JDK	Java Development Kit

1.5   Organization and Work Structure

Bountang Her	- Team Coordinator - Document Handler - User Guide - UI Tester
Jeongsu Park	- Java Coder - Schedule Coordinator - UI Tester - Database Programmer
Aamir Shaikh	- UI Designer - UI Tester - User Guide - Document Assistant
Ortagus Winfrey	- User Guide - UI Tester - Document Assistant - Assistant Database Programmer

1.5.1   Objectives and Priorities

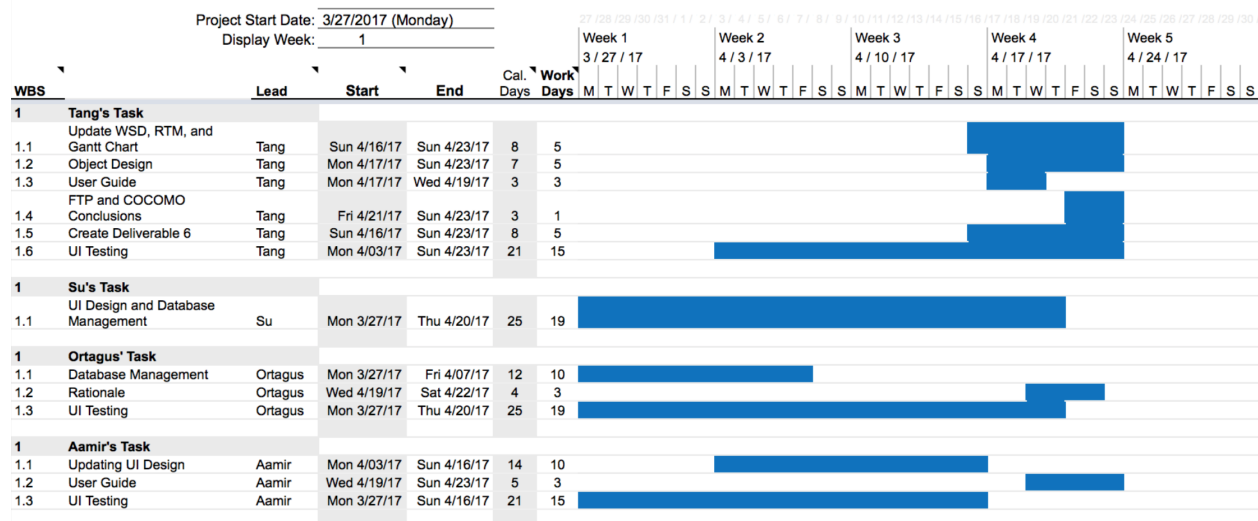Each deliverables will be lead by the Team Coordinator.
- This person will initiate activities by:
  - Assisting members to deliver framework for other members to complete their part of the work.
  - Providing details of each group member's responsibilities including the Team Coordinator himself for the deliverable phases, and due dates.

- ○ Working alongside with Schedule Coordinator and other members to schedule meeting time and a place to discuss the draft document.
- ○ Reviewing comments and feedback among the members, generate a final draft and have the team to review before submission.

1.5.2   Task Allocation

Unity Project FINAL Deliverable Schedule
GSU Books Shopping System

Project Start Date: 3/27/2017 (Monday)
Display Week: 1

WBS		Lead	Start	End	Cal. Days	Work Days
1	**Tang's Task**					
1.1	Update WSD, RTM, and Gantt Chart	Tang	Sun 4/16/17	Sun 4/23/17	8	5
1.2	Object Design	Tang	Mon 4/17/17	Sun 4/23/17	7	5
1.3	User Guide	Tang	Mon 4/17/17	Wed 4/19/17	3	3
1.4	FTP and COCOMO Conclusions	Tang	Fri 4/21/17	Sun 4/23/17	3	1
1.5	Create Deliverable 6	Tang	Sun 4/16/17	Sun 4/23/17	8	5
1.6	UI Testing	Tang	Mon 4/03/17	Sun 4/23/17	21	15
1	**Su's Task**					
1.1	UI Design and Database Management	Su	Mon 3/27/17	Thu 4/20/17	25	19
1	**Ortagus' Task**					
1.1	Database Management	Ortagus	Mon 3/27/17	Fri 4/07/17	12	10
1.2	Rationale	Ortagus	Wed 4/19/17	Sat 4/22/17	4	3
1.3	UI Testing	Ortagus	Mon 3/27/17	Thu 4/20/17	25	19
1	**Aamir's Task**					
1.1	Updating UI Design	Aamir	Mon 4/03/17	Sun 4/16/17	14	10
1.2	User Guide	Aamir	Wed 4/19/17	Sun 4/23/17	5	3
1.3	UI Testing	Aamir	Mon 3/27/17	Sun 4/16/17	21	15

1.5.3   Work Structure Document (WSD)
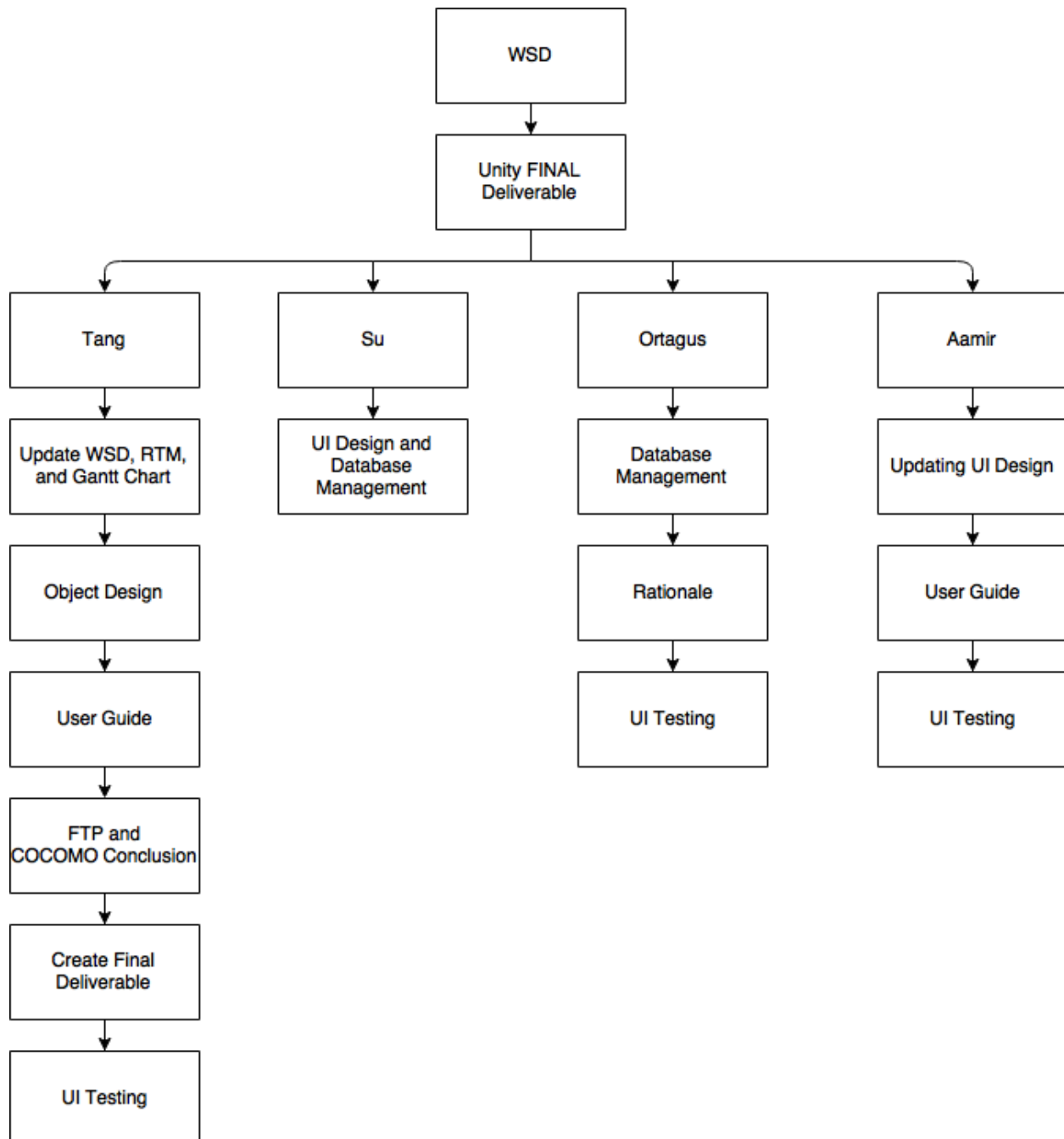
1.6   References

[1]   Bernd Bruegge & Allen H. Dutiot. *Object-Oriented Software Engineering: Using UML, Patterns and Java: 3rd edition*. Prentice Hall. 2010.
[2]   http://www.utdallas.edu/~chung/CS6354.

1.7   Overview

Team Unity's goal is to build a GSUB shopping system that services to the well-being of GSU students, providing an optimal alternative option in mitigating their spendings, by exponentially reducing the costs of textbooks.

2   Current System

When user opens GSUB shopping system application while connected to the internet, the user can browse, navigate, and search through the contents for book availability. When the user finds a book he/she is interested in and buys it, a pop up window shall open and prompts the user to create a login account before purchasing. The user will put in their name and contact information and submit their information to GSUB system. The user can then purchase that book, and he/she now has a login account whenever they return to the system.

3   Proposed System

3.1   Overview

The user creates a email/password and nickname to register for the system. The database allow the user to see if the book requested is available to be bought, as well as letting registered users to sell their books through the system. Once a book is added to the database, the database shall display quantity stocked that is available.

3.2   Functional Requirements

The GSUB system updates with the email/password and nickname of the user, and the database allows registered users to access their account. New accounts that are created in GSUB can only accept users with a valid GSU email. When logged into GSUB, the application allows users to access books in the database, that are available to buy.

3.2.1   Main Page
- Upon startup, the system shall let the user see the contents of the page.
- The Main page shall have a signup and login button, as well as an ISBN (International Standard Book Number) search bar for users to input the book's ISBN.
- When user uses the ISBN search bar, the system shall take them to the search results page to see the results found.

3.2.2   Signup
- When user clicks the signup button on the main page, a pop-up box shall open allowing user to input their valid GSU email and create password, nickname.
- When confirmed, the system shall take them to the User Main page.

3.2.3   Login

- When returning user clicks the login button on the main page, a pop-up box shall open allowing user to input their GSU email and password.
- When confirmed, the system shall take them to the User Main page.

3.2.4   User Home Page

- The User Home page shall have a signup, login, user account as well as an ISBN search bar for users to input the book's ISBN.
- Below the ISBN, the page shall displays the latest listing of books added to the GSUB inventory.
- A home button is shall be available on all pages for the user, except for the main page.
- When user clicks on the home button, the system shall return the user to User Home page.

3.2.5   My Account Page

- The My cart button is shall be available on this page for the user.
- User shall have the option to sell by selecting the item and clicking the sell button.
- The page shall also track order while the purchased item is being delivered to the user.
- Before a delivery can made, users shall cancel orders as necessary with a cancel order button.

3.2.6   Search results Page

- Upon the search results page, user shall see the results of items that are found from the main and logged main page.
- The user shall select the book of interest and click the "Add to Cart" button.
- A pop-up prompt shall inform the user to login or sign up.
- If the user is logged in, the system shall direct the user to the Cart page for check out.
- If the user is logged in, this page shall include a home, logout, account, and cart button as directory.

3.2.7   My Cart Page

- The digital cart page shall be initialized from the search results page, when the user is logged in.
- This page shall show the selected book(s), title, ISBN, seller, edition, author, condition, each book's price, description and total price.
- The user shall be able to add more or remove from the items.
- When the user is ready he/she shall click the checkout button to make billing transaction.

3.2.8   Logging Out

- A logout button shall be available on all pages for the user.
- When user clicks on the logout button, the system shall return the user to main page.

3.2.9 Track Order

- To access Track Order page, user shall go in My Account page and click to see details of the order.
- Inside the Track Order page, user shall click on More Details button for further information regarding the arriving items.
- User shall have the option to cancel orders that was shortly purchased.

3.2.10 Forgot Password

- Should the user forgot their password, the user shall click the Forgot Password button on the login screen.
- When the user is directed to the Forgot Password screen, the user shall input their GSU email and nickname.
- If the system recognizes the user's Email and nickname, a pop-up box shall open showing the password.

3.3 Requirement Specification

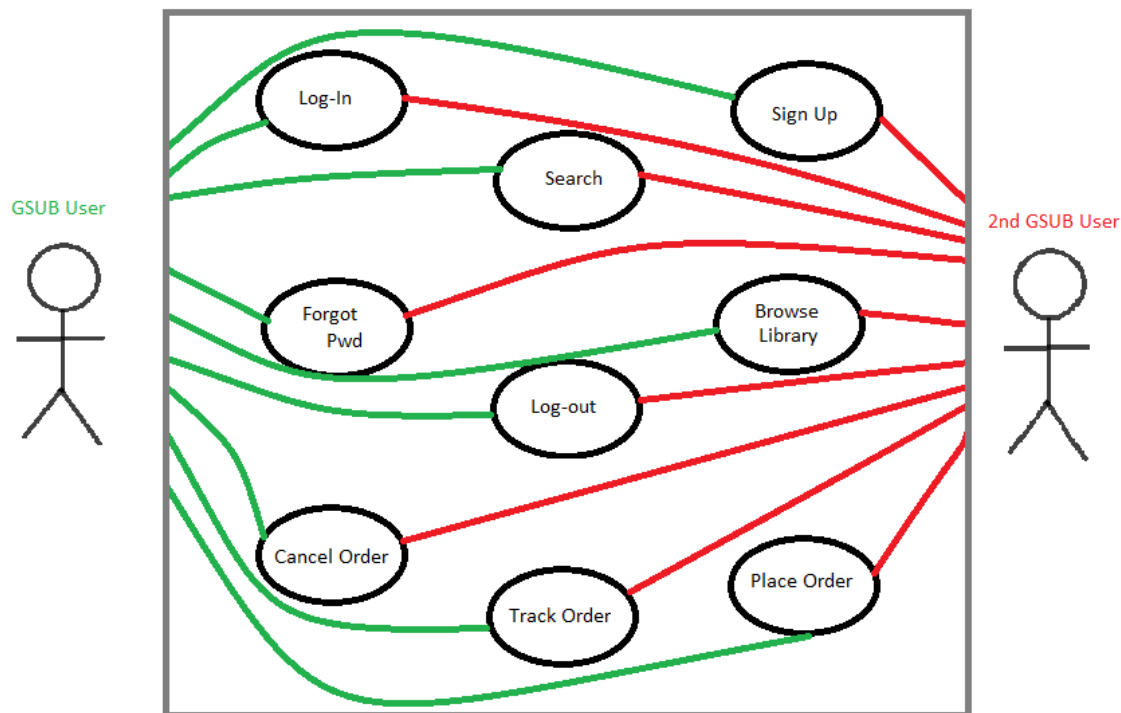| Entry #	Paragraph #	Description	Type	Use Case
1	3.2.2	User clicks the sign up button upon start up from the main page, a pop-up box shall open allowing user to input their valid GSU email and create password and nickname.	SW	UC1 Sign-up
2	3.2.3	When returning user clicks the login button on the main page, a pop-up box shall open and allow user to input their GSU email and password. When confirmed, the system shall take them to the User Main page.	SW	UC2 Log-In
3	3.2.4	The User Home page shall have a signup, login, user account as well as an ISBN search bar for users to input the book's ISBN. The page shall also display the latest listings of books added to the GSUB inventory. A home button shall be available on all pages for the user, except for the main page. When user clicks on the home button, the system shall return the user to the User Home page.	SW	UC3 Browse Library
4	3.2.5	In the My Account page, there shall be listing of books that user has currently sold. The page shall track order while the purchased item is being delivered to the user.	SW	UC7 Purchase History
5	3.2.5	Before a delivery can made, users shall cancel	SW	UC6

		orders as necessary.		Cancel Order
6	3.2.6	Upon the search results page, users shall see the results of items that are found from the main and User Home page. The user shall select the book of interest and click the "Add to Cart" button.	SW	UC4 Search
7	3.2.7	This page shall display the selected book(s) ISBN, title, edition, and total price for the user to review. The user shall be able to add more or remove from the items. When the user is ready he/she shall click the checkout button to make transaction.	SW	UC5 Place an order
8	3.2.9	A logout button shall be available on all pages for the user. When the user clicks on the logout button, the system shall return the user to main page and end the current account session.	SW	UC8 Log-out
9	3.2.11	Inside the Track Order page, the user shall click on More Details button for further information regarding the arriving items. The user shall have the option to cancel orders that was shortly purchased.	SW	UC9 Track Order
10	3.2.12	The user shall click the Forgot Password button on the login screen. When the user is directed to the Forgot Password screen, the user shall input their GSU nickname and their GSU email to see the password via prompt.	SW	UC10 Forgot Password

3.4   Use Cases Specifications

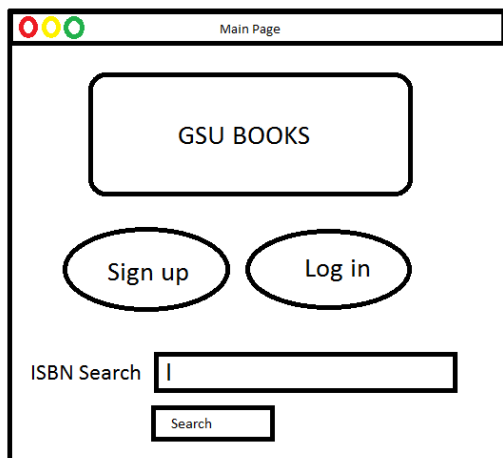| Use Case Name	PlaceBookOrder
Participating Actor	● User
Entry Condition	● The user opens GSUB application, creates a nickname/email and password to register for the system and finds a book to purchase.
Exit Condition	● User has a book order placed, and a login account for GSUB.
Flow of Events	1.) User creates a nickname/email and password to register in

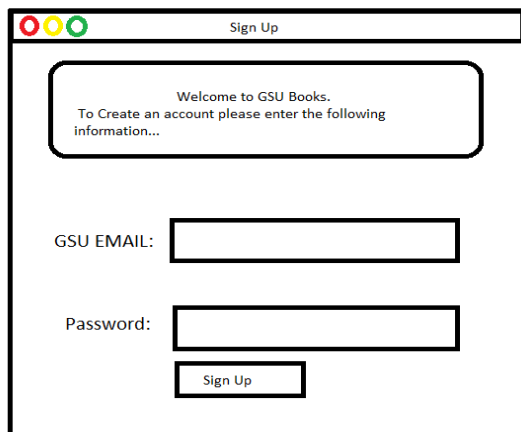|	GSUB. 2.) The system recognizes the user has a valid GSU email, and approves user's login to be created. 3.) User browses and navigate through the contents of GSUB. 4.) User searches for a particular book, and buys it. 5.) GSUB takes user to the checkout page to review orders. 6.) User reviews order and confirms to place book on order. 7.) The system acknowledges user's order, and user now has the option to log off or log on, the next time he/she returns to GSUB.

3.4.1   Use Case Diagram

3.5   Horizontal Prototype User Interface

This is the main page. The user can begin signing up by clicking the "signup" button or logging in with the "login" button. User can also begin search by typing in the text's ISBN into the ISBN query box.
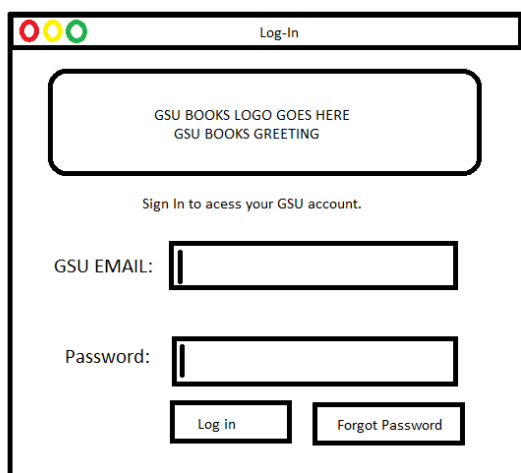
This is the screen for the user to register their valid GSU student email and create password.

This screen are for users whose already registered to GSUB. Users login by inputting their GSU student email and password.
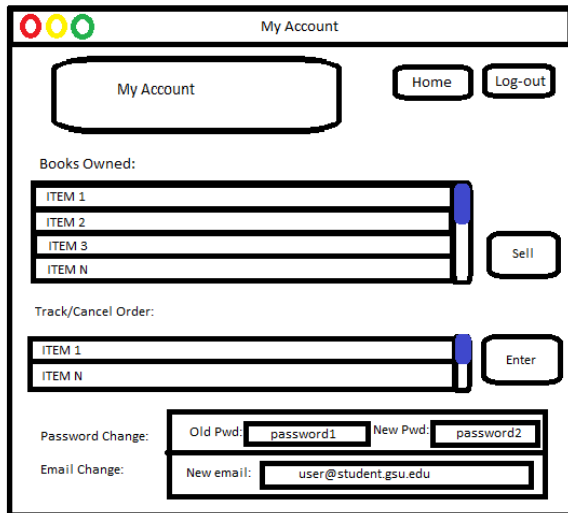
After logging in, this screen shows the User Home page. This page provides button for users to sign out or access the personal information page. Inside the description box are items that the ready to bought and checked out. While some items the user already bought, and is ready to be sold.
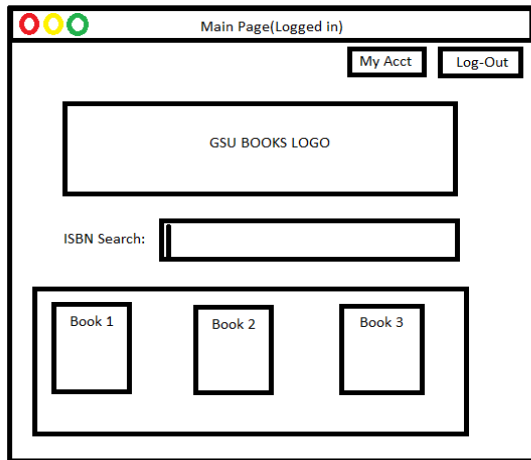
This screen is a Search Results page. When the user inputs an ISBN from the Main Page, it leads them here to see what items the system was able query as a result. When user finds the book, he/she can select that item and click "Add to Cart" button to check out.
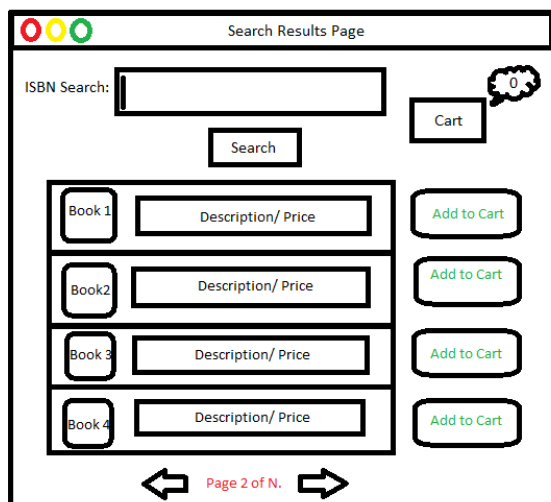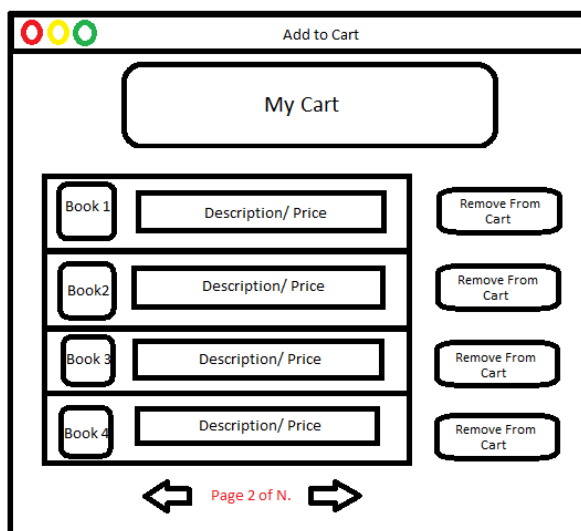
The screen is a user account page. Users can see the books they currently own, and track orders on books that have been purchased and not yet received.

This screen is a Cart page. Showing description and quantity of books in the digital cart before checkout.

This is a Tracking and Cancel Order screen. User can view items that are bought but not yet been received. Also, the user can cancel orders within a short period of time after they purchased the order.

This screen is a Forgot Password page. Users can access this by clicking on the "Forgot Password" button located on the login page. He/she will input their GSU email and new password to create new password for login.

4   Database Used

The database of preference that will be used to create GSUB will be SQLite

5   Function Point Cost Analysis

Number of User Inputs	10	x	○ 3	○ 4	● 6	= 60
Number of User Outputs	100	x	○ 4	○ 5	● 7	= 700
Number of User Inquiries	5	x	○ 3	○ 4	● 6	= 30
Number of Files	50	x	○ 7	○ 10	● 15	= 750
Number of External Interfaces	5	x	○ 5	○ 7	● 10	= 50

Count = Total -- 1590

Note. By clicking on the buttons above more information about the measurement parameters will be available.

```
        0           1           2           3           4           5
        |           |           |           |           |           |
      No       Incidental   Moderate    Average    Significant   Essential
    Influence
```
Rate each factor (Fi, i=1 to14) on a scale of 0 to 5:

F1. Does the system require reliable backup and recovery?   5
F2. Are data communications required?   5
F3. Are there distributed processing functions?   5
F4. Is performance critical?   5
F5. Will the system run in a existing, heavily utilized operational environment?   4
F6. Does the system require on-line data entry?   5

F1. Does the system require reliable backup and recovery?   5
F2. Are data communications required?   5
F3. Are there distributed processing functions?   5
F4. Is performance critical?   5
F5. Will the system run in a existing, heavily utilized operational environment?   4
F6. Does the system require on-line data entry?   5
F7. Does the on-line data entry require the input transaction to be built over multiple screens or operations?   5
F8. Are the master files updated on-line?   2
F9. Are the inputs, outputs, files or inquiries complex?   3
F10. Is the internal processing complex?   5
F11. Is the code designed to be reusable?   5
F12. Are conversion and installation included in the design?   5
F13. Is the system designed for multiple installations in different organizations?   0
F14. Is the application designed to facilitate change and ease of use by the user?   0

[Calculate] [Reset]

Result. According to the input your project has: **1892 FP**

6   Construction Cost Model (COCOMO)

The GSUB application would be of organic complexity according COCOMO.

Intermediate COCOMO Model

Software Project	a_i	b_i	c_b	d_b
Organic	3.2	1.05	2.5	0.35
Semi-detached	3.0	1.12	2.5	0.38
embedded	2.8	1.20	2.5	0.32

$$E = a_i(KLOC)^{b_i} * (EAF) \qquad D = c_b(E)^{d_b}$$

- E = Effort applied in person-months.
- KLOC = Line of Code in the thousands.
- EAF = Effort Adjustment Factor
- D = Development time in chronological months.
- a_i, b_i, c_b, d_b = Coefficients provided from the Intermediate COCOMO model.

EAF Table

Cost Drivers	Ratings					
	Very Low	Low	Nominal	High	Very High	Extra High
Product Attributes						
Required Software Reliability	0.75	0.88	1.00	1.15	1.40	
Size of Application Database		0.94	1.00	1.08	1.16	
Complexity of the product	0.70	0.85	1.00	1.15	1.30	1.65
Hardware Attributes						
Run-time performance constraints			1.00	1.11	1.3	1.66
Memory constraints			1.00	1.06	1.21	1.56
Volatility of the Virtual Machine experience		0.87	1.00	1.15	1.30	
Required turnaround time		0.87	1.00	1.07	1.15	
Personnel Attributes						
Analyst Capability	1.46	1.19	1.00	0.86	0.71	
Applications experience	1.29	1.13	1.00	0.91	0.82	
Software engineer capability	1.42	1.17	1.00	0.86	0.70	
Virtual machine experience	1.21	1.10	1.00	0.90		
Programming language experience	1.14	1.07	1.00	0.95		
Project Attributes						
Use of modern programming practices	1.24	1.10	1.00	0.91	0.82	
Use of software tools	1.24	1.10	1.00	0.91	0.83	
Required development schedule	1.23	1.08	1.00	1.04	1.10	

Cost Driver attributes:
1. Product Attributes:
   a. Required software reliability.
      ● Low: 0.88
   b. Size of application database.

- Low: 0.94
  c.   Complexity of the product.
    - Very Low: 0.7
2.   Hardware Attributes:
  a.   Run-time performance constraints.
    - Nominal: 1
  b.   Memory constraints
    - Nominal: 1
  c.   Volatility of virtual machine environment.
    - Low: 0.87
  d.   Required turnaround time
    - Low: 0.87
3.   Personnel Attributes:
  a.   Analyst capability.
    - Nominal: 1
  b.   Applications experience.
    - Very Low: 1.29
  c.   Programmer capability.
    - Nominal: 1
  d.   Virtual machine experience.
    - Nominal: 1
  e.   Programming language experience.
    - Nominal: 1
4.   Project Attributes:
  a.   Modern programming practices.
    - Low: 1.10
  b.   Use of software tools.
    - Very Low: 1.24
  c.   Required development schedule.
    - Nominal: 1

Variables:

- $EAF = (.88) * (.94) * (.7) * (1) * (1) * (.87) * (.87) * (1) * (1.29) * (1) * (1) * (1) * (1.10) * (1.24) * (1) = .77$
- $a_i = 3.2 \qquad b_i = 1.05 \qquad c_b = 2.5 \qquad d_b = 0.38$
- $KLOC = 5000 \div 1000 = 5$
- $E = a_i * (KLOC)^{b_i} * (EAF) = (3.2) * (5)^{1.05} * (.77) \approx 13.4 \ Person \ Months$
- $D = c_b * E_b^d = (2.5) * (13.4)^{0.38} \approx 6.7 \ months$
- $E \div D = (13.4) \div (6.7) = 2 \ people.$

In reality, the planner may decide to use only two people and extend the project duration accordingly.

6.1   FTP and COCOMO Comparisons and Conclusion

Since we first used the FTP at the earlier stage of our project, we analyzed that the project will cost a high amount of effort and time, especially due to our team's first time creating an application. We tried to correct and change as many possible errors in the inputs and outputs of the calculation, in hopes to get close to a realistic result. Later using the COCOMO with a more updated prototype, the cost of effort and time in making the application seems more accurate, in terms of development process, scheduling, complexity, reliability and constraints. The FTP seems takes into account of a basic and general overview of the application's requirement. COCOMO included all of the elements of FTP in more refined sense, which made it better us to understand. Therefore, the COCOMO provided a more accurate calculation to our project.

7   Sequence Diagrams

7.1   Use Case #1: Sign-up

The user signs up using their information for the system. If the sign up information is not valid for the system, then the application alerts the user that the sign up has failed. If the information is valid, then their information is stored in the database, and the sign up is successful.

Sign-up
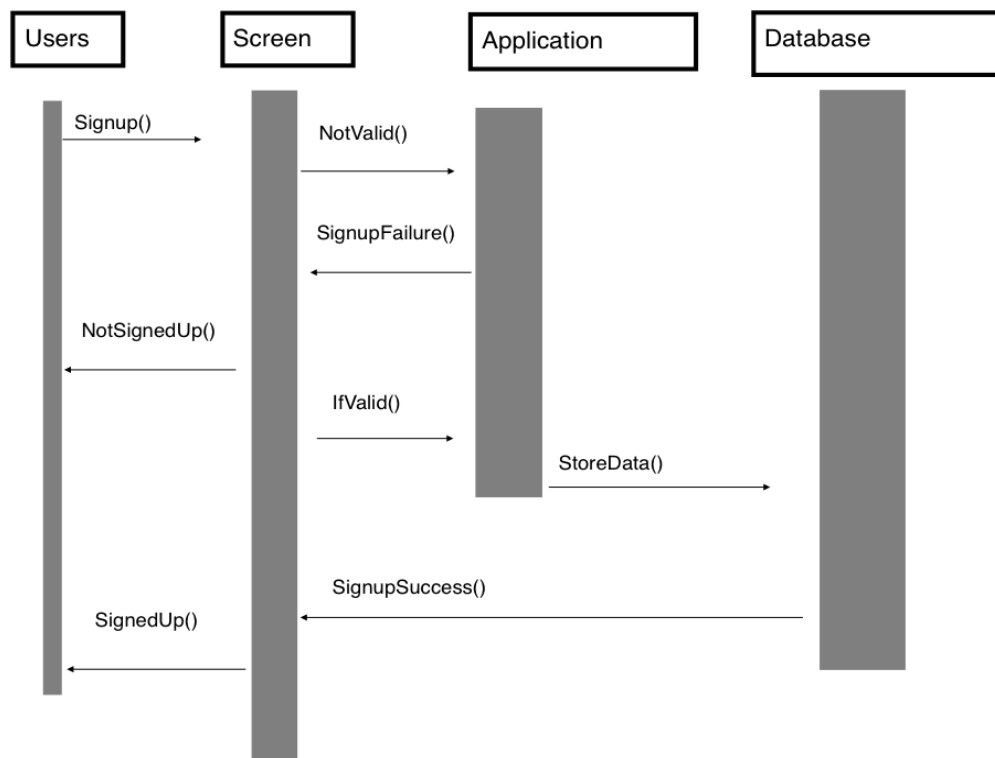
7.2   Use Case #2: Login-In

The user attempts to log into the system. If the login credentials don't match what is presented in the database for the user, the login fails. If it matches the information for the user, then they are logged into the system.
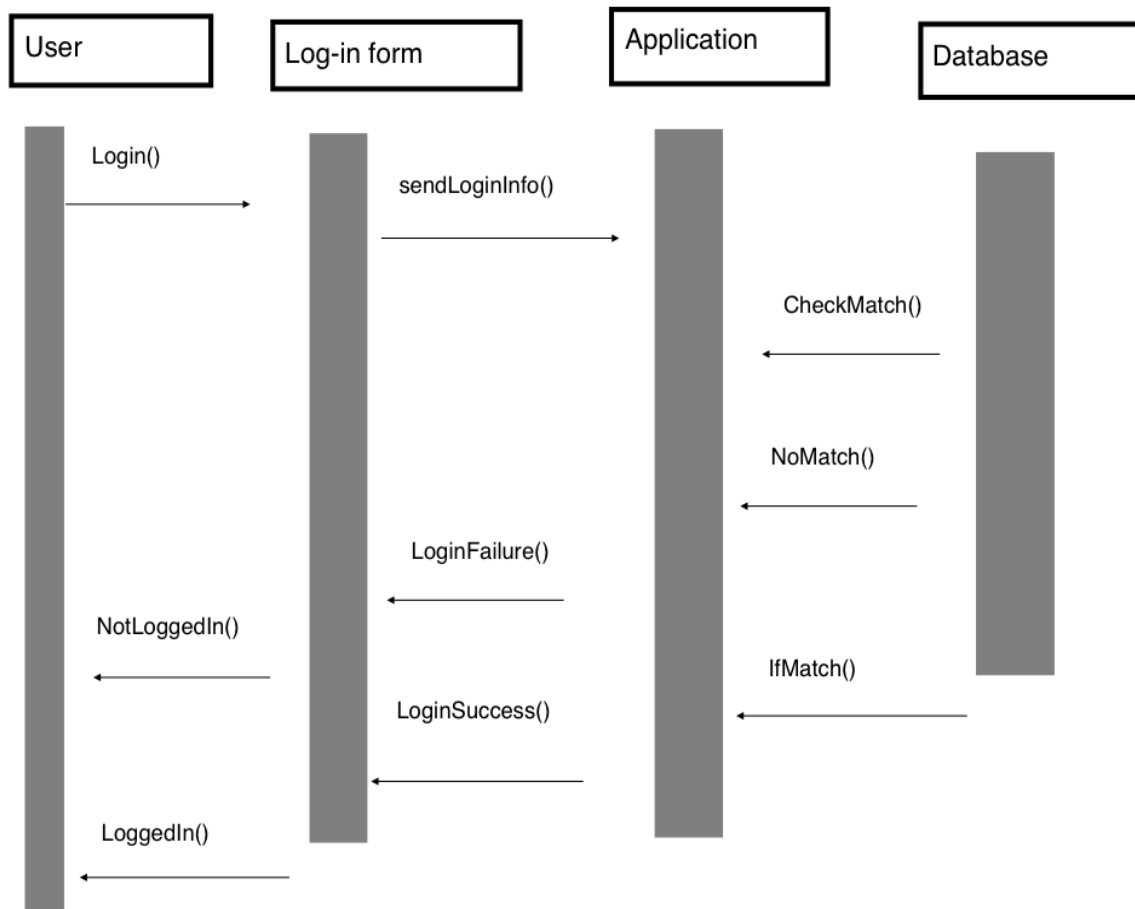
7.3   Use Case # 3: Browse Library

If the user is logged in the database, the system sends the current selection of books to the main page to be browsed. If the user is not logged in, the system will sent present the login page to the user to login.

Browse Library
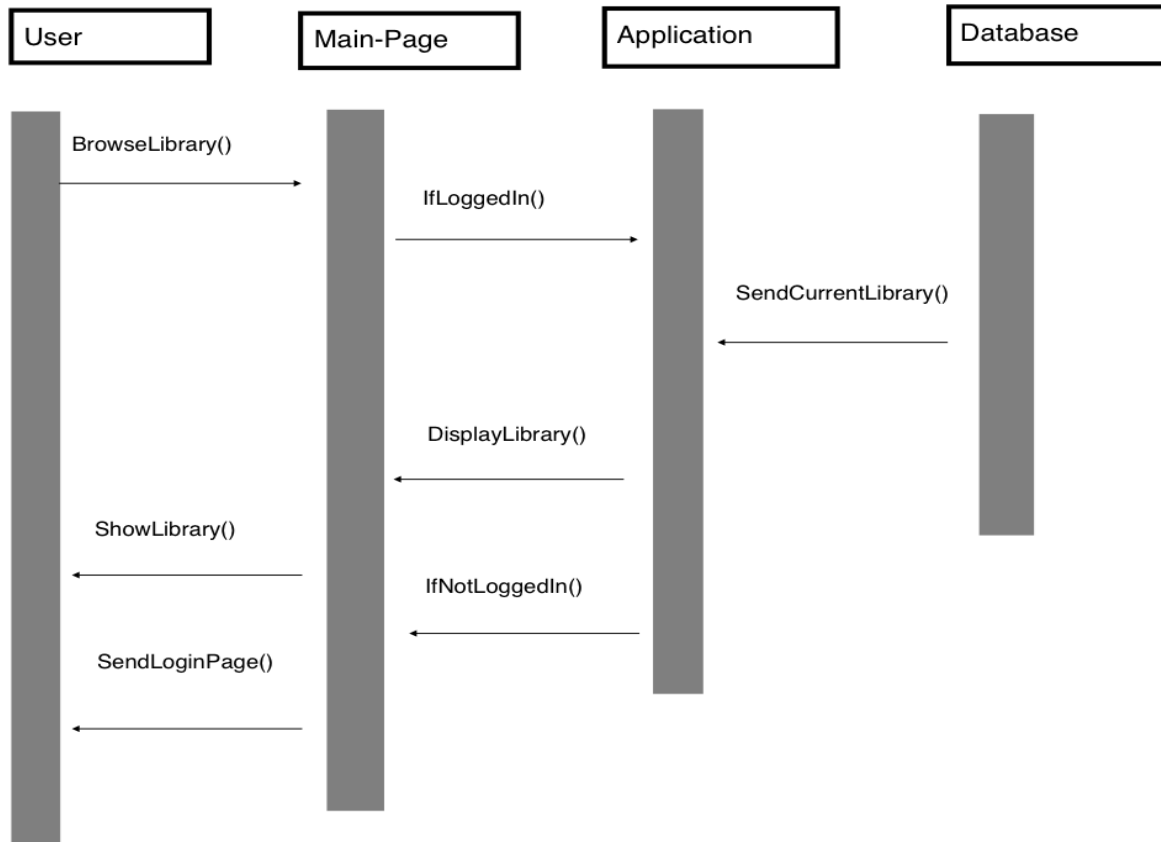
7.4   Use Case # 4: Search

The user searches for a book via its ISBN. If the ISBN matches a book in a database this book is returned, if the does not then no book is returned.

Search
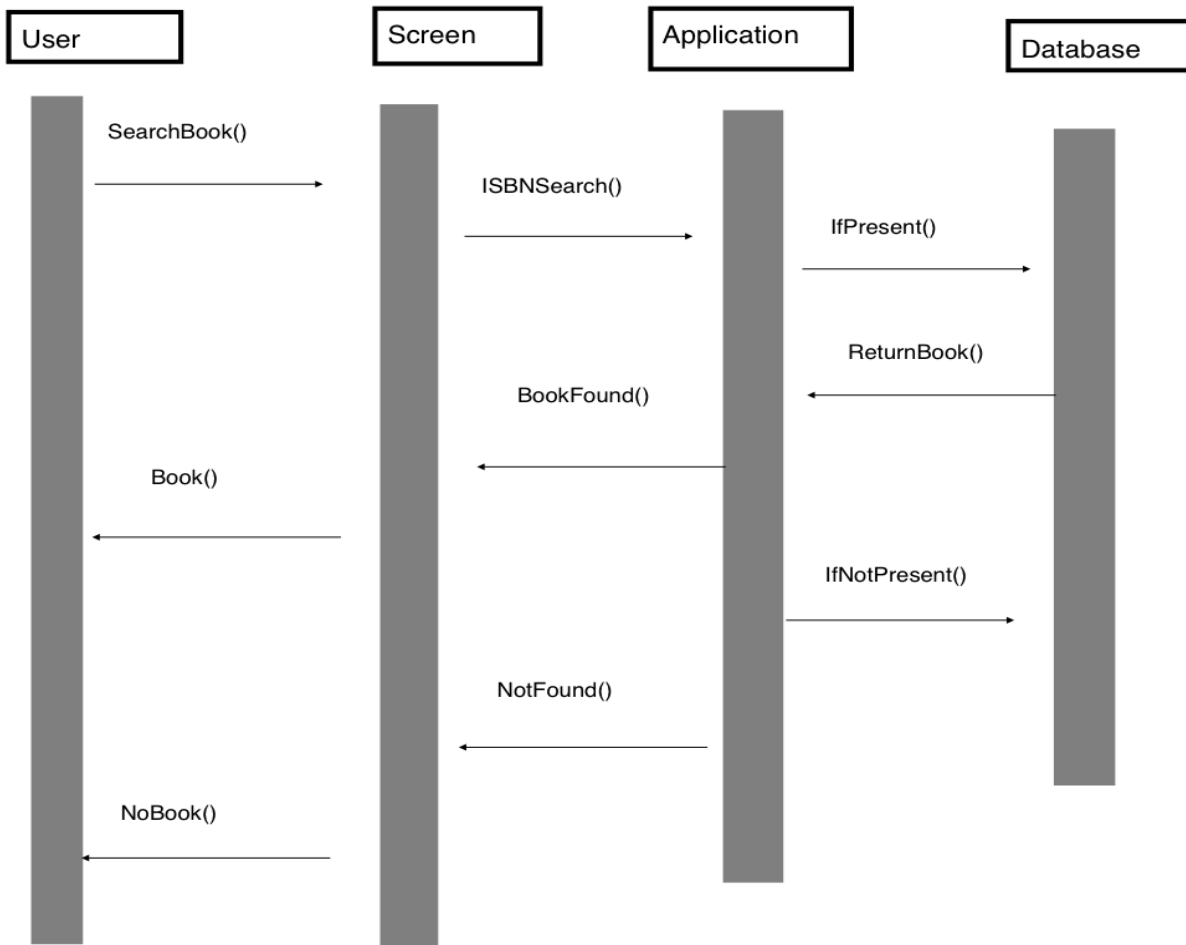
7.5   Use Case # 5: Place an order

If the book is available from the database for purchase then it is purchased when the user selects it. If the item is not available, then no order is placed.

Place Order
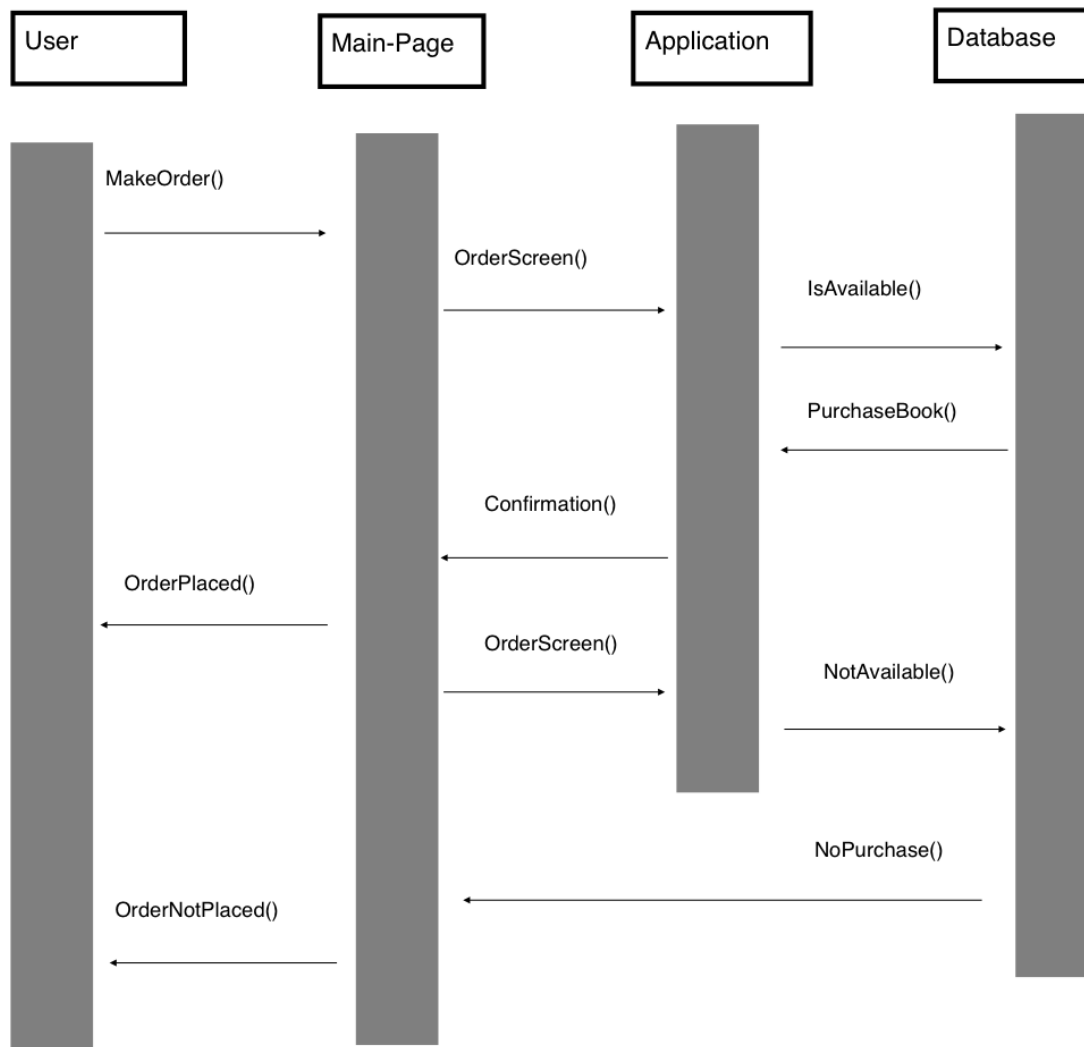
7.6   Use Case # 6: Cancel Order

The user goes through a cancel screen and removes the book from the cart. If the book is removed from the cart, then the order is cancelled.

Cancel Order
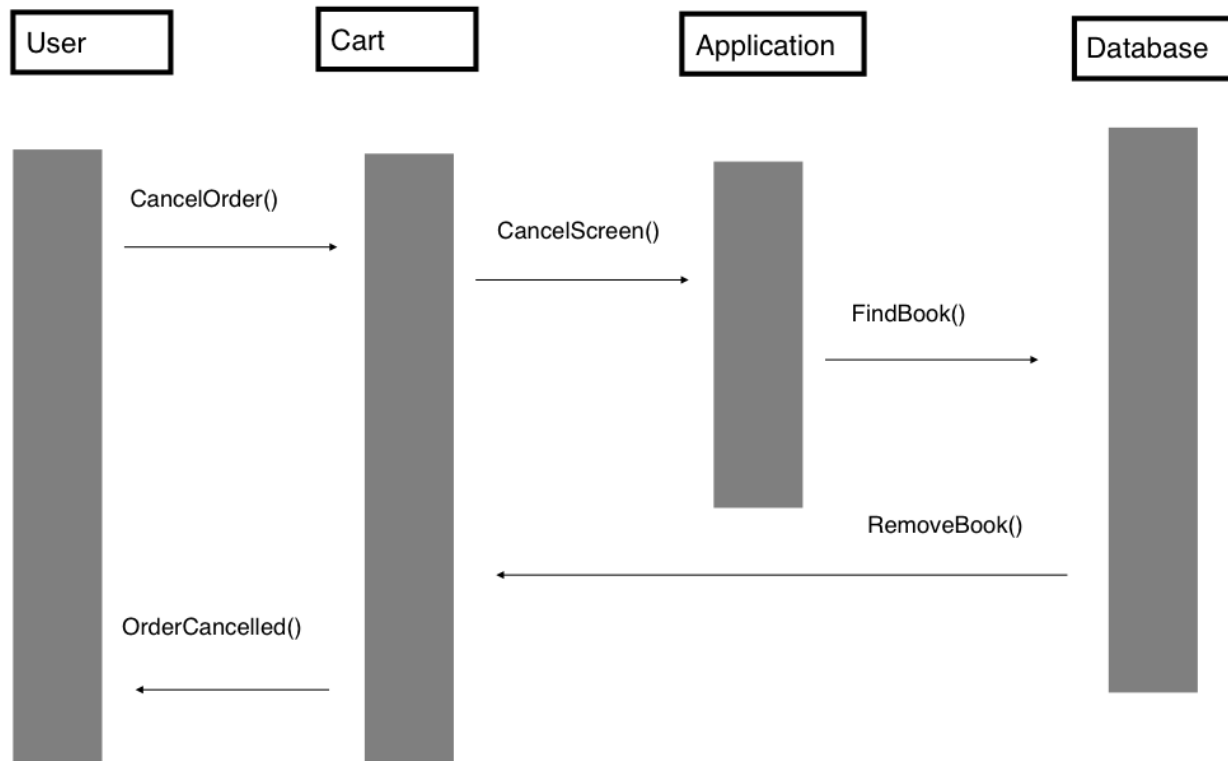
7.7   Use Case # 7: Purchase History

The user checks their search history in through their account page. The system displays the information about their purchase history stored in the database.

Purchase History

User	Screen	Application	Database

Checkhistory()

DisplayHistory()

QueryDatabase()

DisplayDatabase()

PurchaseHistory()
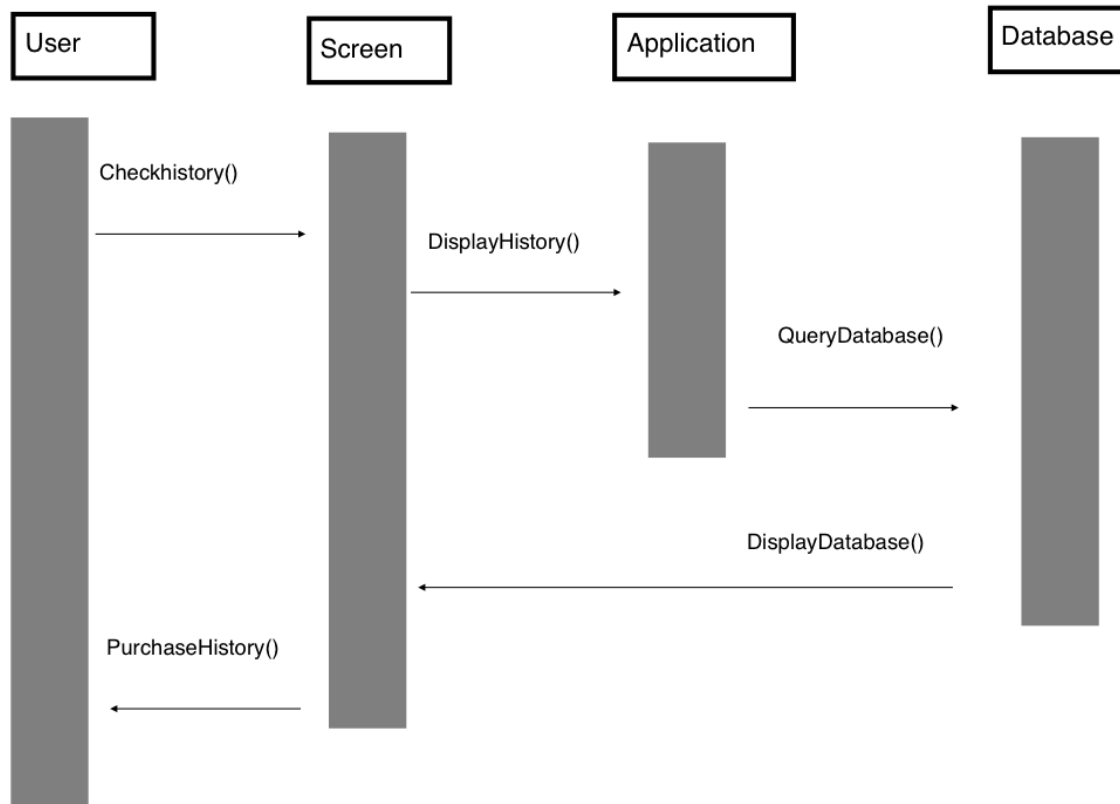
7.8   Use Case # 8: Log-out

When user clicks the logout button, the user will be logged out of the system and database.

Log-Out
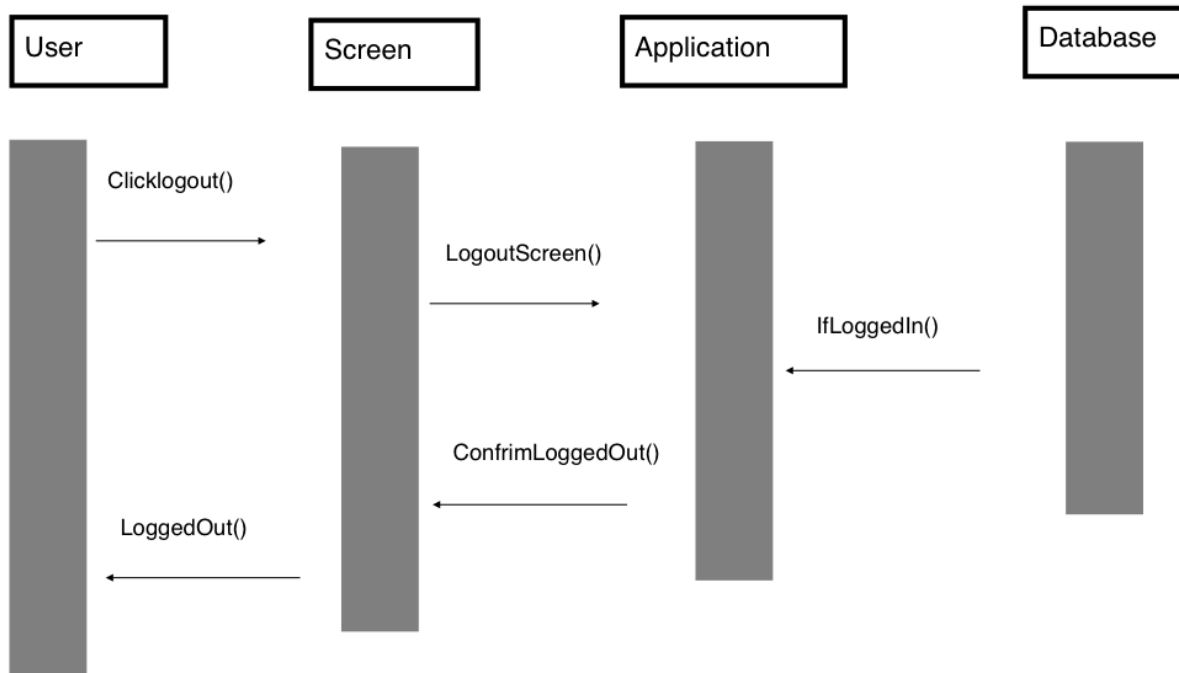
7.11   Use Case # 9: Track Order

The user clicks the book tracking button on their account page. From there the display tracking information is shown via the application querying the database for the stored information, and returning the tracking info for that specific user to the page.

Book Tracking

User	Account page	Application	Database

ClickTracking()

DisplayTracking()

QueryDatabase()

ReturnTrackInfo()

ShowTrackInfo()
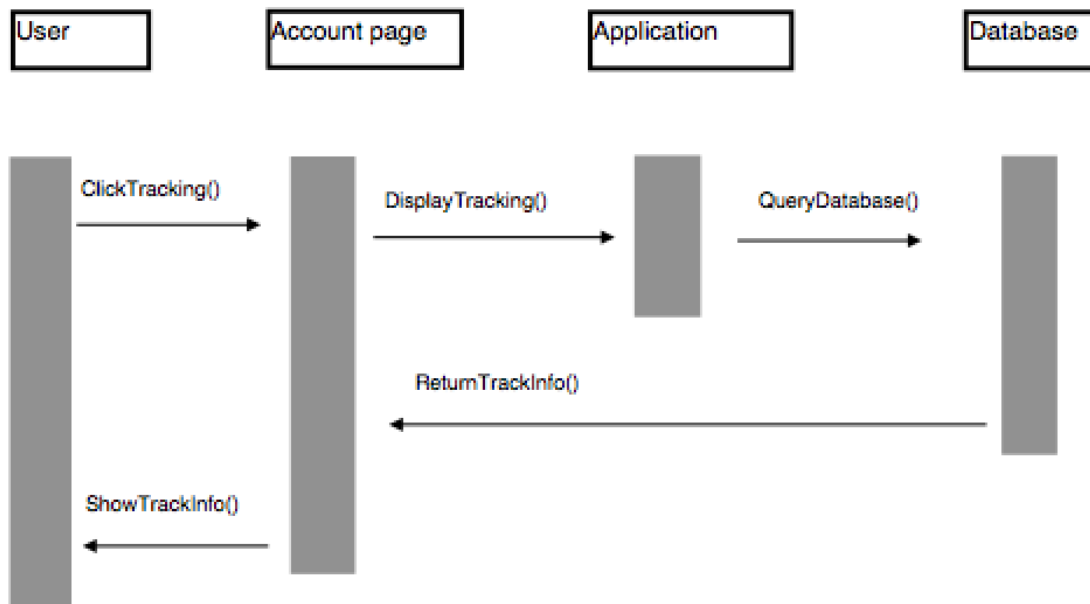
7.12   Use Case # 10: Forgot Password

The user clicks the forgot password button and puts in their information. If it matches what is put in then their password is returned on screen to be put in.

Forgot Password
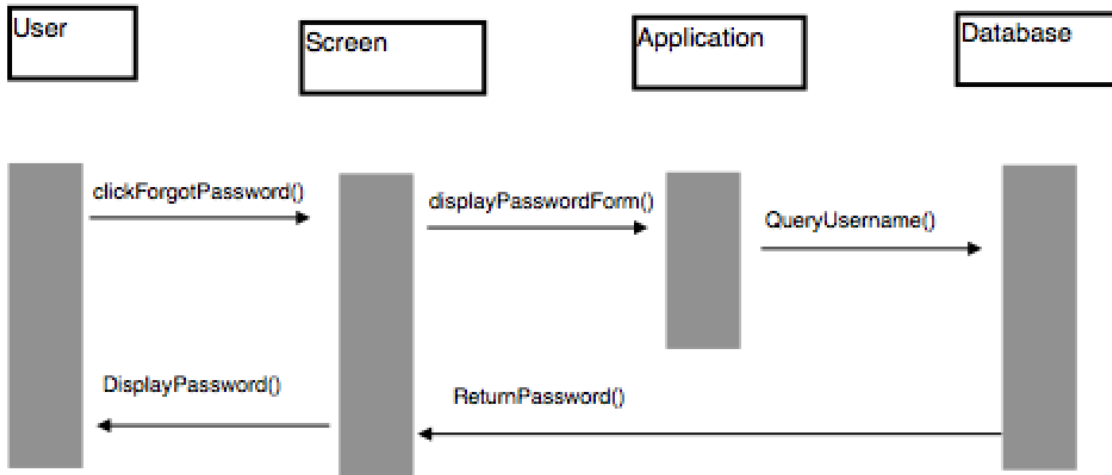
8   Software Architecture

Model View Controller (MVC) will be the software architecture used as a design pattern for implementing user interfaces.

9   Object Class Category Interaction Diagram (CID)

Mainpage
Title : String
Register() Login()

Register
Email : String Password : String
+Signup(String email, password) +StoreData(String email, password)

Login
Email : String Password : String
+Login(String email, password) +DisplayUserPage() +ForgotPassword(String email)

Cart
CartTotal : Integer OrderTotal : Double TrackOrder : Integer
+PurchaseOrder(int CartTotal) +ConfirmOrder(int OrderTotal) +TrackOrder(int TrackOrder) +UpdateData(String Library)

BrowseLibrary
Title : String Quantity : Integer Price : Double Seller : String
+AddtoCart(int ISBN) +UpdateCart(int ISBN)

UserPage
ISBNSrch() : Integer
+SearchBooks(int ISBN) +Sellbooks(int ISBN) +DisplayLibrary()

LogOut
Email : String Password : String
+Logout(String Email)

10   Object Design

11   Use Case Rationale

The following template describes each use case rational in the use case diagram.

11.1   Sign-up

Brief Description
  ● This use case describes how a user creates an account with GSUB.

Flow of Events

Basic Flow
  ● This use case starts when the GSUB user wishes to create an account with GSUB.
  ● The user first clicks on the sign up button.
  ● The system then requests that the user enter a GSU email, and an n key long password.
  ● The user enters his/her name and other personal information.
  ● The system adds the user's information into the GSUB system.

Alternative Flow
  ● Invalid Email/ Password
     ○ If in the **Basic Flow,** the user enters an invalid information the system displays an error message. The user must correct the mistakes, or can choose to start the signup process over again.

Special Requirements
  ● None

Pre-Conditions
  ● None

Post-Conditions
  ● If the use case was successful, the user has now created an account with GSUB. If not, the system state is unchanged.

Extension Points
  ● None

11.2   Log-In

Brief Description
  ● This use case describes how a user logs into the GSUB system.

Flow of Events

Basic Flow
- This use case starts when the GSUB user wishes to Login to the GSUB system.
- The system requests that the user enter his/her email and password.
- The user enters his/her email and password.
- The system validates the entered email and password and logs the user into the system.

Alternative Flow
- Invalid UserID/ Password
  - If in the **Basic Flow,** the user enters an invalid email and/or password, the system displays an error message.
  - The user can choose to either return to the beginning of the **Basic Flow** or cancel the login, at which point the use case ends.

Special Requirements
- None

Pre-Conditions
- The GSUB user must already have an existing GSUB account.

Post-Conditions
- If the use case was successful, the user is now logged into the system. If not, the system state is unchanged.

Extension Points
- None

11.3   Browse Library

Brief Description
- This use case describes how a GSUB user can look at the selection of books available in the GSUB library.

Flow of Events

Basic Flow
- This use case starts when the GSUB user wishes to browse the GSUB library.
- The system presents the GSUB user with the home page.
- The GSUB user can then scroll through the pages of books available until he/she finds one she likes.

Alternative Flow
- If the user cannot find a book though browsing they can use the built in search feature to narrow down the resulting hits.

Special Requirements
- None

Pre-Conditions
- The GSUB user must have an existing GSUB account and must be logged into it.

Post-Conditions
- If the use case was successful, the user can now view and browse the GSUB library.

Extension Points
- None

11.4   Search

Brief Description
- This use case describes how a GSUB user or Admin can search through the selection of books in the GSUB library to locate a specific one.

Flow of Events

Basic Flow
- This use case starts when the GSUB user/Admin wishes to search for a specific book(s) in the GSUB library.
- The system presents the GSUB user/Admin with the home page, which includes a search bar at the top.
- The GSUB user/Admin can then select the search bar and find a book by its ISBN number.

Alternative Flow
- If the user cannot find a book though searching, the book is most likely unavailable or out of stock.

Special Requirements
- None

Pre-Conditions

● The GSUB user/Admin must have an existing GSUB account and must be logged into it.

Post-Conditions
● If the use case was successful, the user can now find specific books in the GSUB library using the search bar.

Extension Points
● None

11.5   Place an order

Brief Description
● This use case describes how a GSUB user/Admin can place an order once they discover a book they like.

Flow of Events

Basic Flow
● This use case starts when the GSUB user/Admin wishes to place an order though GSUB.
● The system presents the GSUB user/Admin with a checkout page.
● The GSUB user/Admin can then proceed to a confirmation page, and submit the order.

Alternative Flow
● The GSUB user/Admin can also add the book to their cart and continue shopping for other books they may want.

Special Requirements
● None

Pre-Conditions
● The GSUB user/Admin must have an existing GSUB account and must be logged into it.

Post-Conditions
● If the use case was successful, the GSUB user/Admin can now place an order, or add books to their cart.

Extension Points
● None

11.6   Cancel Order

Brief Description
- This use case describes how a GSUB user/Admin can cancel an order(s) that has been placed.

Flow of Events

Basic Flow
- This use case starts when the GSUB user/Admin wishes to cancel an order they recently placed.
- The GSUB user/Admin must go to their account page in order to cancel an order.
- The GSUB user can then select the purchase, and hit cancel order.

Alternative Flow
- None

Special Requirements
- None

Pre-Conditions
- The GSUB user/Admin must have an existing GSUB account and must be logged into it.

Post-Conditions
- If the use case was successful, the user can now cancel orders they have places though GSUB.

Extension Points
- None

11.7   Purchase History

Brief Description
- This use case describes how a GSUB user/Admin can view books that they have purchased in the past.

Flow of Events

Basic Flow
- This use case starts when the GSUB user wishes to browse the books they have purchased though GSUB. The user must access their account information page,

and click on purchase history. The GSUB user/Admin can then scroll through the books that they've purchased.

Alternative Flow
● None

Special Requirements
● None

Pre-Conditions
● The GSUB user/Admin must have an existing GSUB account and must be logged into it.

Post-Conditions
● If the use case was successful, the user can now view all of the books they've purchased through GSUB.

Extension Points
● None

11.8   Log-out

Brief Description
● This use case describes how a GSUB user can log out of their GSUB account.

Flow of Events

Basic Flow
● This use case starts when the GSUB user wishes exit the GSUB application by clicking the logout located in the top right hand corner of the application.
● The GSUB user will then be prompted with a confirm and a logout successful screen.

Alternative Flow
● None

Special Requirements
● None

Pre-Conditions
● The GSUB user must have an existing GSUB account and must be logged into it.

Post-Conditions

- If the use case was successful, the user can now log out of their GSUB account.

Extension Points
- None

11.9   Track Order

Brief Description
- This use case describes how a GSUB user can tack their orders.

Flow of Events

Basic Flow
- This use case starts when the GSUB user wishes to track an order.
- The GSUB must log into their account, and go to their personal account page.
- The user will then select the "track or cancel order" button, and will be redirected to another page.
- The redirected page will allow the user to track any order they have made.

Alternative Flow
- The user can also cancel an order they have made from the same screen.

Special Requirements
- None

Pre-Conditions
- None

Post-Conditions
- If the use case was successful, the user can now track their orders.

Extension Points
- None

11.10   Forgot Password

Brief Description
- This use case describes how a GSUB user can change their password in case they forget their current one.

Flow of Events

Basic Flow

- This use case starts when the GSUB user wishes to log-in to the system but is unable because they forgot their password.
- The GSUB user must click on the "forgot password" button on the login screen.
- The user will be redirected to a new screen where they can enter their email, and new desired password.
- The user submits the new info, and the system will update the password.

Alternative Flow
- If the user email cannot be located, then the password will not be changed.

Special Requirements
- None

Pre-Conditions
- None

Post-Conditions
- If the use case was successful, the user can now change a password, in case they forgot their existing one.

Extension Points
- None

12   Object Rationale

12.1   Package SignUp

- Class UserSignUpUI
    - This class of the application represents the sign up window. This class allows the GSUB user to create an account with GSUB.
- Class UserAcc
    - This class tells the system to store the user's data into the database.
- Class AcccountSucess
    - This class represents whether the account create was successful.
        - Method: EmailVerfication(String email)
            -
- Class MainPageLoggedIn
    - This class represents the main window of the application. The user can choose to view books, search for a specific book, or check their account.
- Class AccountException
    - This class represents that the account creation was unsuccessful, and displays the exception.

12.2   Package LogIn

● Class MainPgLogIn
  ○ This class is used to login to represent the login system.

12.3   Package BrowseLibrary

● Class Searcher
  ○ This class is used to allow the user to search and browse the GSUB library.
● Class DataStore
  ○ This class is used to store the user's cart information to the database.

12.4   Package Search

● Class SearchUI
  ○ This class which will be used to search through the books which are present in the database via its numerical ISBN number.

12.5   Package Order

● Class CheckoutForm
  ○ This class represents the checkout page where books are added to the cart for users to review order before placing order.

12.6   Package Cancellation

● Class CancelUI
  ○ This class allows the user to cancel an order for a book placed using the application.

12.7   Package PurchaseHistory

● Class HistoryUI
  ○ This class is a user interface which access the application and allows user to select a book that they currently purchased and owned.
● Class CheckHistory
  ○ This class allows the user to access a record of books that are purchased and currently owned by the user.

12.8   Package Logout

● Class LogoutUI
  ○ This class is a user interface that talks to the application when the user is signing out of his/her account.
● Class ClickLogout
  ○ This class represents a button that allows the user to click and exit out of their GSUB account.

- Class IfLoggedIn
  - The class allows the database to synchronize with the application to see if the user still logged in. If the database sees that user is logged out of the application, then the database will uninitiate itself from the application.

12.9   Package TrackOrder

- Class PackageTracker
  - This class is used to track a package that the user has placed.

12.10   Package ForgotPassword

- Class NewPassword
  - This class is used to create a new password for a user to replace the old password.
- Class DatabasePwdUpdate
  - This class is used to update user's password in the database system.

13   Rationale

The Georgia State University Book system, or GSUB for short, is an interactive Book selling and purchasing platform that will be available for students starting in the summer semester of 2017. The User is able to search for books they want to purchase by ISBN. From this the title of the book, the author, its edition, the condition of the book, and price are also displayed along with the book. Also a textbox is shown under this information, which will display information about this book to the user. This allows the user to see more information not only about the actual condition or class information for the book being sold, but also more about the topics that are covered in the book. The program also allows the user to sell their own school textbooks, which would allow them to enter all of the information above about the book so that it can be sold to other users using the program.

The User registration information is stored in the database which checks if the user exists, and has the right credentials, when the user registers and logs in to the system. Due to the system handling user personal information such as credit card numbers and addresses maintaining user security is very important. An added security feature is hashed passwords so other users would not be able to see your password as you log into the system. If a user has forgot their password there is a check system within the program to allow the user to enter a special key, titled nickname, they used when joining the application. When this is entered the user's password is returned to them so they can log in. This wide-scope system makes hacking by brute-force incredibly difficult based on the fact that a nickname can be almost infinitely anything as all characters are available to be placed into this system.

Once logged in to the system the books currently in the database are displayed, with the most recent displayed at the top of the list. This allows new books just entered into the system to get maximum visibility, and thus keeps users coming back to check for books as the new books are always right in front of them. We also display the edition of the book in question from the search page so the user does not have to click on the book in order to see which version of

the book it is. This will allow quick and efficient browsing for users in the system so that they can quickly see whether or not the specific book they need is present in the system. This also effectively eliminates the common mistake other book buying platforms have of not explicitly stating the specific edition of the book outright, which in turn increases the success rate of our platform. Once the book is ordered the information for their address is also stored in the database, and able to be shown to them, and edited, any time before the book is delivered to them.

1.   To use the program the user must register an account with the system by entering a valid GSU email, a password, and a nickname. Non-GSU emails are not allowed.
2.   When placing a book into the application the user should have all of the required info about the book for record keeping purposes. This includes the ISBN, the author, the edition, the condition, and the price they want to charge to order the book.
3.   For higher sellers there is an easy to use interface system on the account page which allows them to see which books they currently have in the system, and which ones they have sold in the past.
4.   When purchasing a book the user must input card number, name on card, card type, billing address, security number, and a phone number.
5.   When choosing a shipping address the user is allowed to have a different address than the one used as the billing address.
6.   After placing an order the user is still able to update their info.

14   Test Cases

Attribute	Description
Name	Register Account
Tester	Bountang Her
Input	User Clicks register and inputs their email, password, and nickname to be stored within the system.
Oracle	From this the program stores the information of the user in the database allowing them to proceed to login into the system.
Log	**Incorrect Information** GSU Email: bher1@gmail.com Password: asdf NICKNAME : tang Action: Click Register Result: Text pop-up: "Non GSU personnel are not authorized to register! ." **Correct Information** GSU Email: bher1@student.gsu.edu Password: asdf

	NICKNAME : tang Action: Click Register Result: Text pop-up: "Successful."

Attribute	Description
Name	Log-in
Tester	Bountang Her
Input	User clicks log in, and inputs the information they previously entered for register into the program
Oracle	If these credentials are found within the system then the user is prompted that they are signed in, and redirected to the main page. If not the user is prompted that the credentials entered is not found.
Log	**Incorrect Information** GSU Email: (Blank Entry) Password: asdf Action: Click Log In Result: Textbox popup: "Username or password is not correct. Try again." **Correct Information** GSU Email: bher1@student.gsu.edu Password: asdf Action: Click Log In Result: Textbox pop-up: "Log in sucessful. Welcome."

Attribute	Description
Name	Search book
Tester	Bountang Her
Input	User searches for a book using an ISBN number in the search bar
Oracle	If the book is present it is returned when the number is searched, if it is not present, then no book is returned when the book is searched.
Log	**Non-Existing ISBN** ISBN Search: 100 Action: Click Search Result: The application cannot find such nonexistent ISBN number. Application displays next page with blank entries for book title, edition, author, and ISBN.

	Existing ISBN ISBN Search: 23 Action: Click Search Result: Displays next page with book title, edition, author, and ISBN.

Attribute	Description
Name	Add To Cart
Tester	Bountang Her
Input	User clicks on the book and selects add to cart.
Oracle	When clicked the user is notified that the book has been added to their cart. From here the selected book is available to be purchased by the user. The information of the book inserts into the cart3 table of the database.
Log	Action: User clicks Add to Cart. Result: When clicked the user is notified that a pop-up box show the message "Successfully added to the cart". It takes the user to the My cart page.

Attribute	Description
Name	Remove From Cart
Tester	Ortagus Winfrey
Input	From their account/cart page the user selects remove item from cart.
Oracle	The item stored in the cart is removed from it. The user is prompted that the item is removed from their cart. From the database standpoint the tuple is deleted from the cart table.
Log	**Remove Cart** Action: The user clicks the remove from cart button next to the book. Result: Textbox pop-up: "Successfully deleted from your cart.".

Attribute	Description
Name	Forgot Password
Tester	Ortagus Winfrey
Input	User clicks forgot password on the login screen.

Oracle	They are prompted to enter their email and nickname. If both these credentials are correct and found in the system a prompt returning the password is shown to the user.
Log	**Incorrect information:** GSU Email: owinfrey1@student.gsu.edu Nickname: (BLANK ENTRY) Action: Click Submit Result: Textbox pop-up: "email or nickname is not correct. Please try again" **Correct Information:** GSU Email: owinfrey1@student.gsu.edu Nickname: 123 Action: Click Submit Result:Textbox pop-up: "Your password is 123"

Attribute	Description
Name	Purchase/Confirm Order
Tester	Ortagus Winfrey
Input	User clicks the confirm Proceed to Checkout button from their cart page.
Oracle	From the cart page the user reviews their order, and clicks the Proceed to Checkout button. The next page ask to input the shipping address. After submitting this, the user needs to fill out billing address, cardholder name, card type, credit card number, expiration date, card security ID number, and user telephone number.
Log	**No Confirmation:** Action: The user clicks "Go Back" or "Home" on the Add to cart page once they have selected a book Result: The program leaves this page and returns back to the search page where the user is able to click on another book to order. **Confirmation:** Action: The user clicks "Add to Cart" on the page showing information about the book they clicked on. Result: The page directs them to a page where they are able to fill in their shipping, and other information, that is required to ship the book to them.

Attribute	Description
Name	Track / Cancel Order(s)

Tester	Ortagus Winfrey
Input	User selects the one order from track / cancel order(s) lists on their account page.
Oracle	If the User has an order, which has been completed through the system, the information about this order's shipping location is returned to the user.
Log	**No Order currently being sent/Invalid order:** Action: Click the track order box Result: Nothing is available to click in the box at this point. **Order being sent:** Action: Click Track Package Result: Textbox pop-up: "Delivering to 'Shipment address'" where "shipment address" is the address entered on the shipping address page. **Cancel Order:** Action: Click "Cancel Order" on the track package window Result: A text box prompt appears stating "Successfully cancelled your order". The book is also removed from the "Track/Cancel order(s)" window on the account screen.

14.1   Test Case Rationale

Using the use cases were essential for the GSUB application. Throughout the course of the semester, these use case features were identified and agreed upon to be the most pivotal qualities of the application. The methods were outlined in from use case diagram in order to launch the design for the test cases. A particular program file can effect another, therefore it is important to test the methods individually. By using this test case model, the programmer can test to compare the Oracle output with the actual Log output, in order to mitigate errors and discrepancies.

15   User Guide

Thank you for selecting GSU Books Shopping System as your method of access to shopping for books at a discounted rate. We hope this guide will be help you to effectively navigate and use the program.

15.1   System Requirements

In order for the GSUB application to work:
   ● Make sure your Java Development Kit (JDK) is up to date.
   ● Recommended Operating System:
       ○ Windows 7, 8, 10
       ○ Mac (any version that is post 2000)

- ○ Linux
- Keyboard
- Mouse

15.2   Run Program

To run the program, double-click the unity.jar file. The program should take a moment to load, and then you'll be directed to the main page.

15.3   Sign Up

On the upper-right of the screen of the main page, click "Sign-Up" button. The user will be prompt to a signup page to register their GSU email, password, and nickname. When completed, click the "Register" button on the lower-left screen. The application will return the user to the main page, to login.

15.4   Login

This function is only applicable after the user has successfully sign up to the GSUB. On the upper-left screen main page of the application, click the "Log-In" button. When you are directed to the login page, input your GSU email and password created from the signup. When completed, click the "Log In" button on the lower-left side of the screen, and you will be directed to the main page while logged in.

15.5   Forgot Password

Click on the forgot password button, and it will redirect you to the forgot password page. Once on the forgot password page you must enter your GSU email and nickname. If the Email and Nickname is correct and matches the ones used when you register, then the system will present you with your password. If the email or password is incorrect then the system will prompt you with an error message.

15.6   Search

The search bar is available on the main page of the program. You must enter a specific books ISBN to search for it. If the book is available, the system will display it. Otherwise, there will be an empty list displayed.

15.7   MyAccount

The MyAcct Button will be located at the top right of the main page after you log into the system. If you click on the MyAcct Button it will redirect you to your account settings. In the account setting you can view the books you are selling, track orders, or view books that you have already sold.

15.8   Sell Book

The Sell Book button is in your account settings (MyAcct button). If you click sell book, the system will prompt you to enter the ISBN for the book you wish to sell, and then it will redirect you to another page to enter more information about the book (title, edition, condition, etc.). After you enter all the information, hit submit, and you have completed the process to sell a book.

15.9   My Cart

The MyCart Button is located under your account settings (MyAcct button). If you click on the MyCart button, the system will redirect you to another page where you can view all the books you have added to your shopping cart.

15.10   Proceed to checkout

The "proceed to checkout" button is located under your account settings (MyAcct), and then MyCart. If you click on proceed to checkout, the system will redirect you to a page where you can enter your shipping address. After you enter your shipping info, hit submit, and the system will redirect you to another page to enter billing information. After you enter your billing information, hit submit, and you have just purchased a book.

15.11   Log Out

The "Log out" button is in the top right of the main page, and multiple other pages. If you click on this button, the software will log you out of the GSUB system.

15.12   View Book Description

On the main page, there will be books that are available for purchase. If you click on any of the books the system will redirect you to the book's description. Some descriptions may be cut off, or hidden due to our privacy policy, and will require you to first log into the system to view the seller and full description.

15.13   Add to Cart

After you find a book you like in the GSUB system, you can add it to your cart. To do so, you must first log into the system, then click on the book's description, and at the bottom of the book's description page hit the "add to cart" button. The book is now added to your cart.

16   Project Legacy

In the beginning of the semester our group started out with a total of three members, but fortunately we found the fourth member and together we decided upon creating a shopping

application. We were very familiar with the usage of e-commerce, and the contents needed for users to interact with. Thinking about what sell, we knew we wanted to provide service with the utter most convenience to our customers. Finally, the idea of selling books to college students at a discounted price came to our minds. The thought of trying to sell discounted books to any college students would have been too daunting for, and so we scaled down to GSU students as our primary customers. In making the GSUB application, we allocated tasks to each team members in which to specialize, and work closely together to meet deadlines with deliverables. The key technologies needed to utilize the design was an Integrated Development Environment (IDE), Version Control System (VCS), and a Structured Query Language (SQL) application. The Netbeans IDE was the latest version that allowed us to integrate our codes onto GitHub (our VCS), and use Java Swing Graphical User Interface (GUI) to develop and mitigate what is necessary for the design process. Our databases were managed with SQLite through a FireFox browser. After acquiring the applications to utilize our design, we were able to make changes throughout the semester.