

1) Scenario:

Sarah, a dedicated reader and frequent visitor to her local library, is eager to reserve a copy of the latest bestselling novel, "The Enigma of Shadows." The library's online catalog offers a convenient reservation system for its patrons.

Sarah logs into the library's website and searches for the book. Unfortunately, all copies are currently checked out. Undeterred, she clicks on the "Reserve" button and provides her library card number and contact information. The system confirms her reservation and informs her that she will receive an email notification when the book becomes available. Meanwhile, the library staff receives Sarah's reservation request. They check the system and find that there are currently five copies of the book in circulation. They identify the copy with the earliest due date and assign it to Sarah's reservation.

As soon as the librarian scans the book upon its return, the system automatically associates it with Sarah's reservation. Once the library prepares the book for pickup, Sarah receives an email notification informing her that it is ready.

Filled with excitement, Sarah visits the library and approaches the circulation desk, where she presents her library card. The librarian scans her card, retrieves the reserved book, and checks it out to Sarah's account. The system updates the due date and sends Sarah a reminder notification three days before the book's return deadline.

With the book in her hands, Sarah happily leaves the library, ready to embark on her literary adventure. Thanks to the library's efficient reservation and collection process, Sarah and other readers can enjoy a seamless experience, ensuring easier access to and enjoyment of their favorite books.

2) Do a Noun-Verb Analysis of your scenario.

Noun-Verb Analysis of the Scenario:

Nouns:

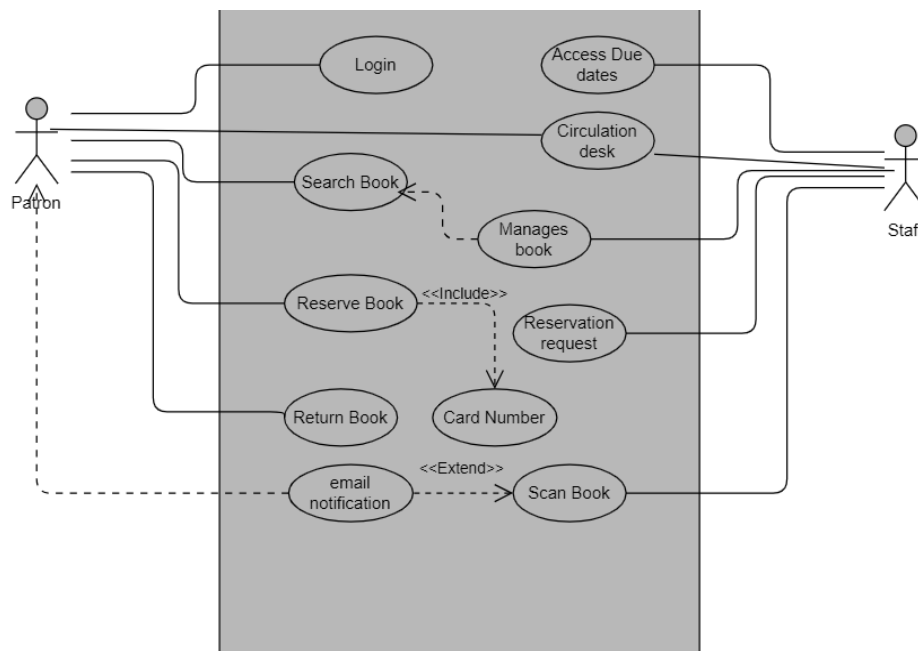
1. Sarah (patron)
2. Library (location)
3. Book (item)
4. Catalog (system)
5. Reservation (action)
6. Copy (item)

7. Website (platform)
8. Contact information (data)
9. Staff (group)

Verbs:

1. Logs in
2. Searches
3. Finds
4. Checks out
5. Reserves
6. Enters
7. Confirms
8. Notifies
9. Receives
10. Provides
11. Scans
12. Assigns
13. Generates
14. Informs
15. Visits

3) Create a Use Case Diagram based on this noun-verb analysis, there should be:



4) Create at least 5 CRC cards, each card needs at least 3 responsibilities and 2 collaborators. You should at least flesh out 1 (preferably 2) of your main use cases.

CRC Card 1: Patron Responsibilities:

- Search for books in the library catalog
- Reserve books that are currently checked out
- Check out reserved books.

Collaborators:

- Library System: Interacts with the system to perform book searches, reservations, and checkouts
- Circulation Desk: Provides assistance during the book checkout process

CRC Card 2: Library System Responsibilities:

- Maintain and update the library catalog
- Handle book reservations and checkouts
- Send notifications to patrons regarding book availability and due dates

Collaborators:

- Patron: Receives notifications and interacts with the system for reservations and checkouts
- Circulation Desk: Receives and processes physical book checkouts

CRC Card 3: Circulation Desk Responsibilities:

- Receive and process book checkouts from patrons
- Provide assistance and answer queries related to book checkouts
- Update the system with book status (checked out, returned)

Collaborators:

- Patron: Interacts with the circulation desk during the book checkout process
- Library System: Receives updates from the circulation desk regarding book checkouts and returns

CRC Card 4: Book Responsibilities:

- Store information about the book (title, author, availability)
- Update availability status when checked out or returned
- Provide book details and availability information to patrons and the library system

Collaborators:

- Library System: Receives updates on the book's availability and manages reservations
- Patron: Searches for and reserves books using the book information

CRC Card 5: Email Notification Service Responsibilities:

Responsibilities:

- The library system sends email notifications to patrons regarding book availability and due dates.
- The library system manages email delivery and tracking.
- The library system formats the notification emails and includes relevant information.

Collaborators:

- Library System: Triggers email notifications based on book availability and due dates.
- Patron: Receives and interacts with email notifications.

Use Case 1: Reserve Book

1. A library patron initiates a search in the library catalog to find a specific book.
2. The library system retrieves the search query and presents the patron with a list of search results.
3. The patron selects a book that is currently checked out and requests a reservation.
4. The library system verifies the book's availability and updates the reservation status for the patron.
5. The library system sends an email notification to the patron, confirming the reservation and providing details such as the estimated availability date.
6. The patron receives the email notification, which informs them about the availability of the reserved book.

Use Case 2: Search Book

1. A library patron inputs a search query for a book in the library catalog.
2. The library system receives the search query and conducts a search across its database.
3. The library system presents the patron with a list of search results that match the query, showing book titles, authors, and availability status.
4. The patron chooses a book from the search results to access more details.
5. The library system displays additional information about the selected book, such as a summary, cover image, and availability status.
6. The patron can opt to reserve the book if it's currently checked out or proceed with other actions, such as checking out an available copy.

5) Create a UML Class diagram that reflects the CRC cards and Use Cases.

