#### **Part 1: Identify Classes**

(10 pts.)

* Identify at least **four key classes** necessary to implement this system.
* Write a short explanation of why each class is needed.

Classes:

1. Book Class – Stores necessary information about each book in the library. This is an essential class to the library as books make up most of what it offers.
2. Library member class – Represents members of the library and is necessary to keep track of who has checked out books and to enforce library rules.
3. Librarian class – Represents librarians who can manage the library’s collection as well as handle various administrative tasks.
4. Book catalog class – This class is responsible for managing books

#### **Part 2: Define Responsibilities**

(10 pts.)

* For each class, list at least **two primary responsibilities** that class must have.

1. Book: - Maintain info about the book such as the title, author, ISBN, and availability status

* Update availability of the book based on if it is checked out or not

1. Member: - Keep track of the books each individual library member has checked out

* Enforce the 3 books at one time rule if member attempts to check out too many books.

1. Librarian: - Add new books to the catalog

* Remove outdated or lost books from catalog

1. Catalog: - Maintain collection of books and keep an accurate availability status

* Allow for books to be searched for, showing their availability status and who has it checked out if so.

#### **Part 3: Identify Collaborators**

(10 pts.)

* For each class, identify **other classes** it interacts with to fulfill its responsibilities and explain why the collaboration is needed.

1. Book collaborators:

* Catalog: Updates availability status when a book is checked out/returned
* Member: Tracks which member has borrowed a book

1. Member collaborators:

* Book: Collaborates to borrow and return books
* Catalog: Track and enforce borrowing rules as well as update the catalogs records on who has checked out the book

1. Librarian collaborators:

* Book: Add or remove books from the catalog
* Catalog: View list of available books as well as checked out books

1. Catalog collaborators:

* Book: Manages the collection of books
* Member: Tracks which books are checked out by which member
* Librarian: Allows Librarians to have administrative functionality by removing/adding books