Activity-1

Scenario: Pakistani government wants to open a "Digital Library" in one of the area located in Karachi through which they wants to provide digital and online services to its library registered member's. They hire you as a " Software Developer" to develop their system. The system should help readers and staff to manage books, members, and borrow/return operations.
The library has many books having both the old and new edition , Each book has a name and it is written by some famous author , If you want to find more information about the book , you search the book through its ISBN number which is access globally, Each book is belongs to certain category or subject . If a member wants to borrow a book he/she should check the status of availability of the book first. The book status determined that the book is either present or not present in the library. Members of the library have to be registered. Members of the library can be both the library staff and readers. For registration purposes a member have to submit their name, ID, contact information and previously borrowed/issued books if they have previously issued it. The Librarian allows the books to be borrowed or returned by the member and keeps the record of due and borrowing date's . The system also generate a overdue report for the librarian which is used to display overdue books and the corresponding member information. The librarian can also be able to add new books, register members, and update book availability.

You as a software developer knows both the "Procedural Programming " and Object Oriented Programming concepts taught in the previous classes of Week-1 , Lecture-1. As a software developer you have to answer the following things :

Task 1: Identify Attributes and functions.
Task 2: Procedural Programming approach?
Task 3: Object Oriented approach? (Model the problem. Identify class,objects).

Task-1

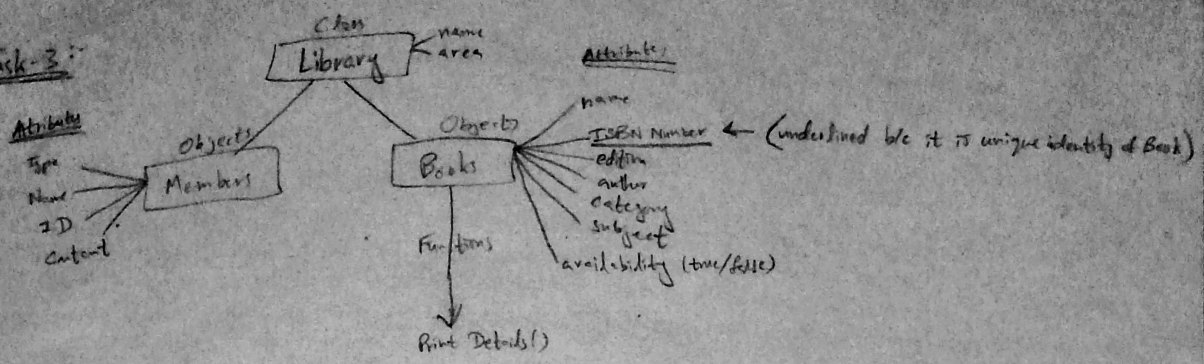
→ Functions:-
- searchBook()
- checkAvailability()
- registerMember()
- allowBorrow()
- generateReport()
- addNewBook()
- updateAvailability()

→ Attributes:-
- bookName
- author
- edition
- Isbn_number
- bookCategory
- bookSubject
- availability (bool)
- memberType (staff/reader)
- memberName
- memberID
- memberContact

→ Classes:-
- Books
- Members
- Library

Task-2: Our procedural programming approach would be making structs for Library, Members and Books having related attributes. As structs can not contain functions, so functions will be outside the structs. To achieve inheritence, we will create instance of Library in 'Members' struct & instance of Members struct in Books.

Task-3:



Teacher's Approach

→ Digital Library will be project name & will not be a class b/c it has no fun & attribute.

BOOK

name
author
edition
ISBN ← (Underlined to show that its unique for all books)
category
avail_status ← (bool)

display_details()

→ Build classes for Readers & Librarian (staff) b/c fun of both are equal & if kept in same class distinguishing just by type (attribute) will give fun to both. Member will be super classes of both the same readers & staff have to be registered

Member
ID
name
count_info

register()
check_avail (Book b)

Reader
num_of_borrowed_books

borrow_books()

Librarian/Library staff
due_date
borrow_date

issued_Book(Book b)
report(due_Date, borrow_Date) reader // Create a report
addBook(Book b)
updateBook(Book b)