Object-Oriented Analysis and Design (OOAD)

Step 1: Requirement Gathering

- Identify what the system should do.

- Actors: User, Librarian

- Actions: Search, Borrow, Return, Add, Remove Books

Step 2: Object-Oriented Analysis (OOA)

Use Case Diagram:

User --> Search Book, Borrow Book, Return Book

Librarian --> Add Book, Remove Book

Step 3: Class Diagram (OOD)

Classes:

- User (userID, name, searchBook(), borrowBook())

- Librarian (inherits User, addBook(), removeBook())

- Book (bookID, title, author, available)

- Library (books, add/remove/search book)

- BorrowRecord (user, book, borrow/return date)

Step 4: Sequence Diagram

Sequence:

User -> Library: searchBook()

User -> Library: borrowBook()

Library -> Book: checkAvailability()

Library -> BorrowRecord: createRecord()

Step 5: OOP Implementation (Python Code Overview)

- Classes: Book, User, Librarian, Library, BorrowRecord

- Methods reflect the design (borrowBook, addBook, etc.)

Final Recap

1. Requirement - Know what to build

2. OOA - Identify classes, actors

3. OOD - Design using diagrams

4. UML - Use Case, Class, Sequence Diagrams

5. OOP Code - Python implementation