10. Library Management system:

Aim :

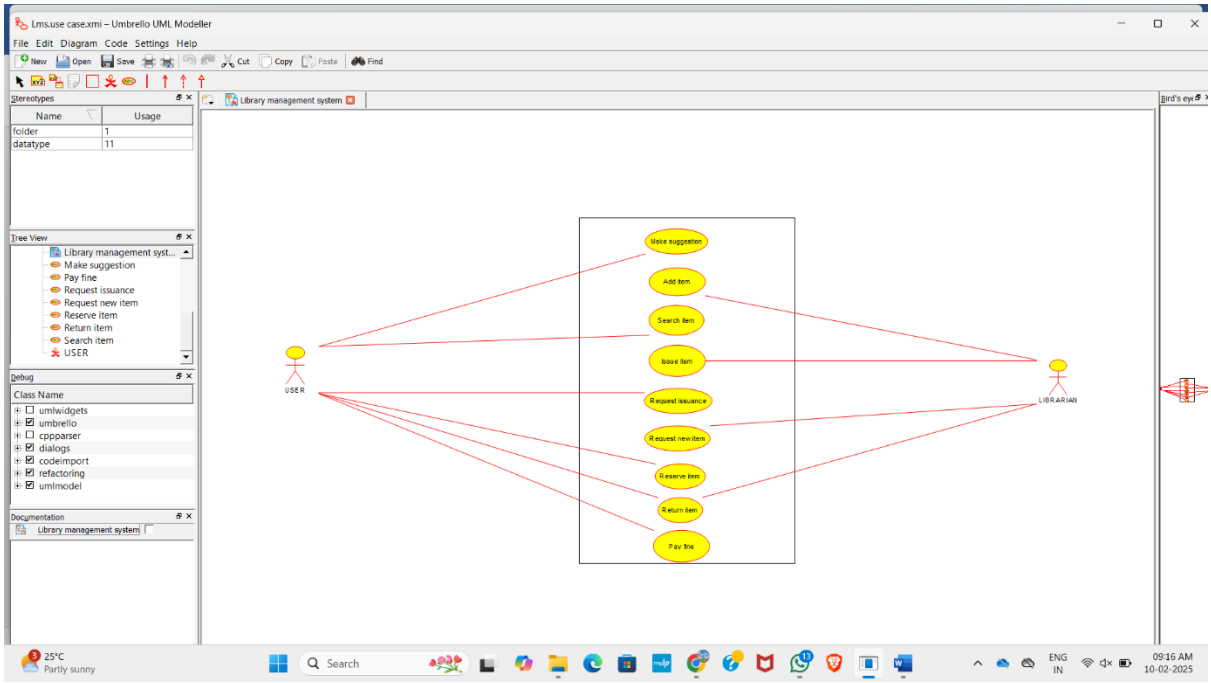
To design a Use Case Diagram for a Library Management System (LMS) that automates library processes, including cataloging books, managing users, handling checkouts and returns, invoicing, and searching for books.

Procedure :

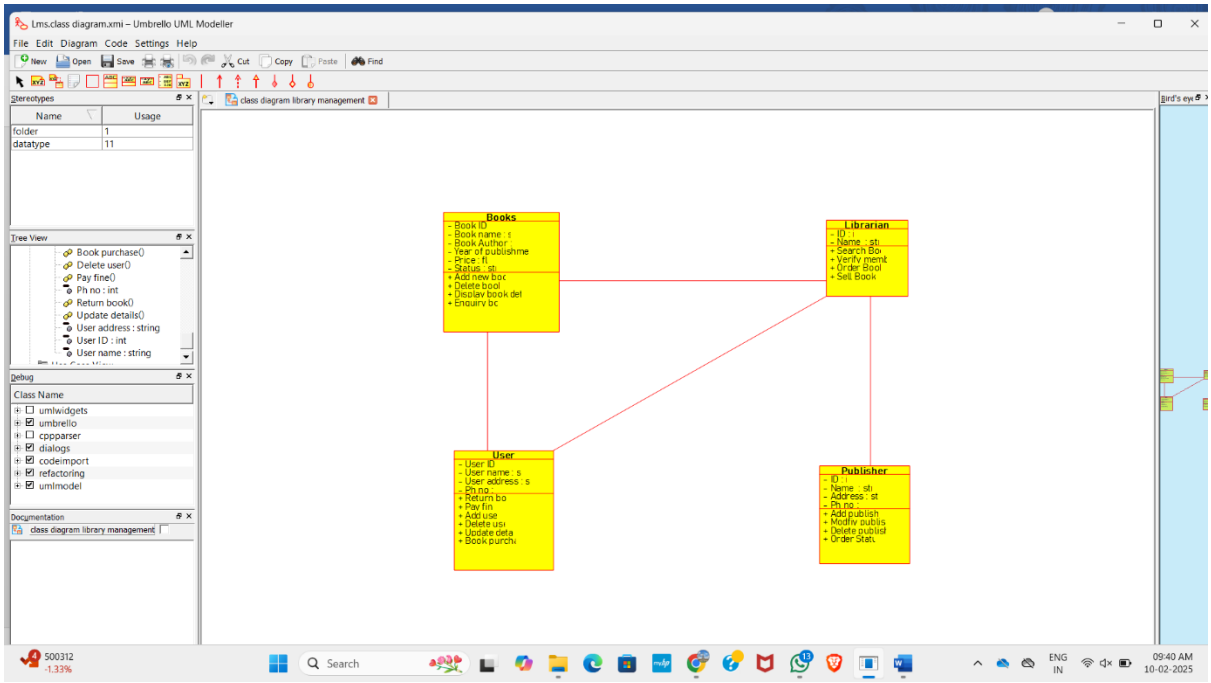
1. Identify the Actors
    - Librarian (Manages books and users)
    - Member (Borrows and returns books, searches for books)
    - System (Handles transactions, invoicing, and book cataloging)
2. Determine Use Cases
    - Book Management (Add, Update, Remove books)
    - User Management (Register User, Manage Membership)
    - Book Search (Search books by Book ID, Title, Author, Publisher)
    - Book Checkout & Return (Issue Book, Return Book)
    - Invoicing (Calculate fines, Generate invoices)
3. Create the Use Case Diagram
    - Draw the actors and system boundary.
    - Connect use cases to relevant actors.
    - Use relationships (e.g., include and extend for dependent operations).
4. Define the System Boundary
    - Show that all actions happen within the Library Management System.
5. Review the Interactions
    - Ensure all major functionalities are represented.
    - Validate that each actor interacts with the correct use cases.
6. Optimize the Diagram
    - Use generalization if two actors share similar roles (e.g., Admin & Librarian).
    - Use extend relationships for conditional cases like overdue fines.
7. Finalize and Document the Use Case Diagram
    - Ensure clarity, completeness, and correct relationships.

- Use tools like Lucidchart, Draw.io, or StarUML for visual representation.

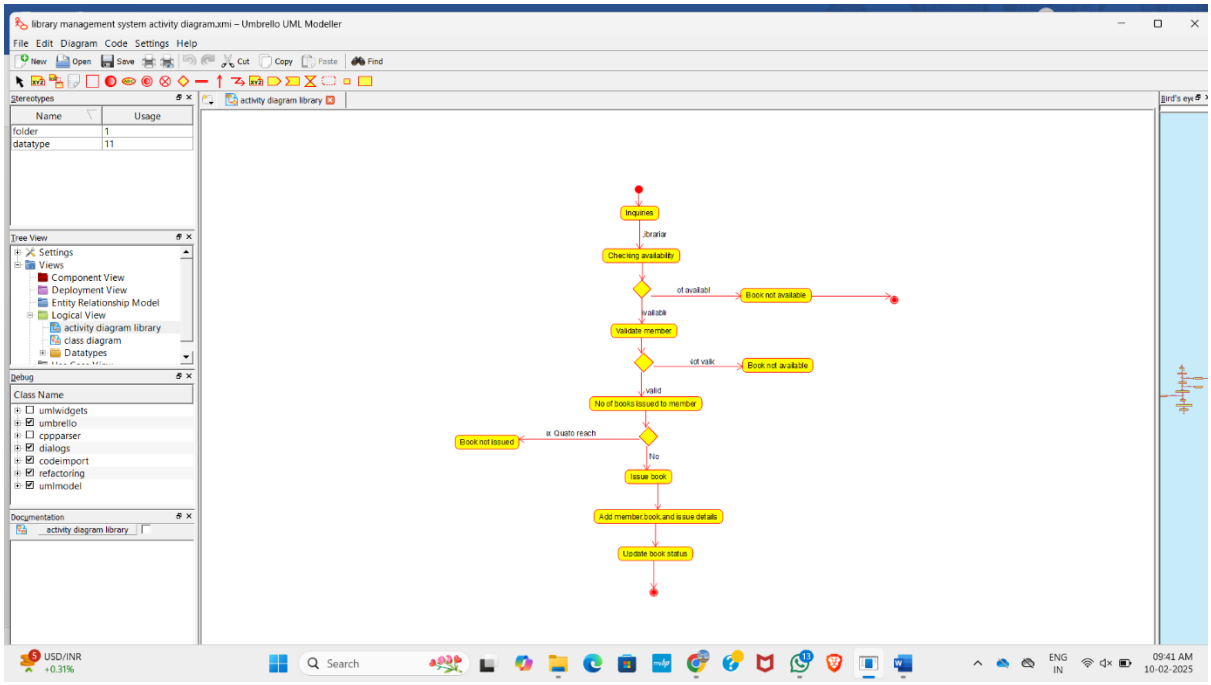
Use Case :



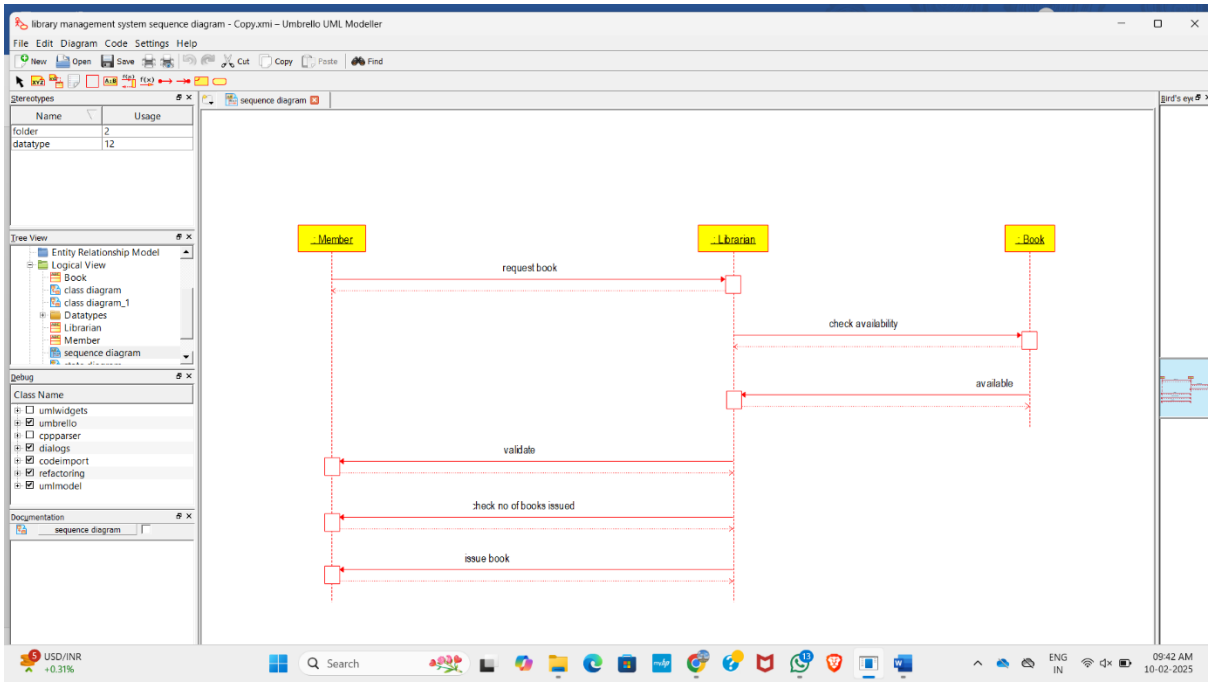
Class Diagram :



Activity Diagram :



Sequence Diagram :



Result :

The Use Case Diagram for the Library Management System successfully depicts the major functionalities like book management, user operations, searching, issuing/returning books, and invoicing. The diagram helps in understanding the roles, interactions, and dependencies of different processes within the library system.