Project Report

Library Management System

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Project Overview:

This project "Library Management System" simulates how to manage library operations digitally and efficiently! It covers things like:

- Borrowing Books and Returning Them
- Managing Availability of Resources within the Library
- Reserving Rooms
- Usage of Libraries' PCs and Tablets
- The Ability for a User to Check his History of Interacting with the Library

Users in the Library Management System are Students and Professors, as well as having an Admin for each library. Note that each Faculty can have multiple libraries.

System Features:

- **Admin Features:**
  - Managing Resources: adding and removing books, meeting rooms, and electronic resources (Tablets and PCs).
  - Rules Configuration: changing borrowing rules in the library (days allowed, penalties, if renewal is allowed) for books and other resources.
  - Statistics and Logs: can view logs, popular resources, overdue items, and frequent users.

- **Student/Professor Features:**
  - Searching for Books
  - Borrow/Return Books belonging to a library that belongs to their faculty
  - Add themselves to waiting lists if a book was being used by another user at the current time
  - Reserve/Release Meeting Rooms
  - Use Electronic Resources (Tablets/PCs)
  - View their history of interacting with the library services

- **Library:**
  - Provide various resources: Physical Books, eBooks, Meeting Rooms, Tablets, and PCs.
  - Restricted to the usage of students and professors within the faculty only.

System Design:

- **Classes: (we have various relationships between classes)**

  o **User (Abstract):**
    - Subclasses: Admin, Student, Professor.
    - Common attributes: name, address, phoneNumber, and emailAddress.
  o **Library:**
    - Attributes: name, faculty, admin, resources, books, rooms, and rules.
  o **Book (Abstract):**
    - Subclasses: PhysicalBook, eBook.
    - Attributes: title, ISBN, author, description, available, publicationYear, and genre.
  o **ElectronicResources (Abstract):**
    - Subclasses: Tablet and PC.
    - Attributes: available.
  o **MeetingRooms:**
    - Attributes: location, phoneNumber, and Reserved.
  o **Rules:**
    - Attributes: studentBorrowDays, professorBorrowDays, renewalAllowedProfessor, renewalAllowedStudent, and latePenalty.
  o **BorrowingData:**
    - Attributes: userName, resourceTitle, borrowDate, returnDate, and resourceType.
  o **Logger:** for tracking users' activities.

- **Relationships:**

  o **Inheritance:**
    - Admin, Student, Professor inherit from User.
    - PhysicalBook, eBook inherit from Book.
    - Tablet, PCs inherit from ElectronicResources
  o **Composition:**
    - Books, Rooms, ElectronicResources compose Library.
  o **Associations:**
    - Admin manages Library.
    - Student and Professor interact with Library.

Conclusions:

The Library Management System Project achieves the following:

- ➢ Handling book inventory, meeting rooms reservation, and resources managements.
- ➢ Ensures that the library's services are restricted to its faculty members
- ➢ Provides comprehensive logs and statistics for admins
- ➢ Ensures that users' needs are supported within these systems