Class table

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| **Class Name** | **Attributes (Fields)** | **Methods (Functions)** | **Relationships** |
| **User** (abstract) | userId: int, name: String, email: String, password: String | login(), logout() | Parent class for Student and Administrator |
| **Student** | borrowedBooks: List<Book> | searchBook(), reserveBook(), borrowBook(), returnBook(), receiveOverdueNotification() | Inherits User, interacts with Book and Loan |
| **Administrator** | None (inherits from User) | manageInventory(), generateReports(), ensureCompliance(), systemMaintenance() | Inherits User, manages Book inventory |
| **Book** | isbn: String, title: String, author: String, availabilityStatus: String | checkAvailability(), updateStatus() | Part of LibrarySystem, associated with Loan |
| **Loan** | loanId: int, student: Student, book: Book, borrowDate: Date, dueDate: Date, returnDate: Date | createLoan(), markReturned(), checkOverdue() | Tracks Student borrowing Book |
| **LibrarySystem** | users: List<User>, books: List<Book> | authenticateUser(), searchBooks(), generateReports() | Manages Users and Books |