Non-Functional Requirements (NFR) – Library Management System

Application Name: Library Management System Project Type: Web Application

Group No: 5

# Security

## Authentication and Authorization

* + - Role-Based Access: The system defines roles such as Member and Admin, each with defined permissions.
    - Access Restrictions: Members can only manage their own accounts and transactions. Admins manage inventory, complaints, and reports.

## Password Security

* + - Passwords are encrypted using standards like bcrypt.
    - First-time login requires changing default credentials.
    - Password strength enforced: minimum 8 characters, uppercase, lowercase, number, special character.

## Data Protection

* + - SQL Injection Protection via parameterized queries.
    - XSS Protection through input sanitization.
    - Session Management includes login session handling and inactivity timeouts.
    - Redirects are validated to trusted URLs only.

# Navigation & User Interface

## User-Friendly Navigation

* + - Fixed navigation bar includes role-based modules.
    - Clear navigation for Members (Home, Books, Donate, Profile) and Admins (Dashboard, Management Panels).

## Flow Management

* + - Members access only their own data.
    - Admins access and manage entire system content.

# Performance

## System Responsiveness

* + - Page load time < 2 seconds.
    - Search and transactions respond within 1 second under normal conditions.

## Query Optimization

* + - Indexed queries used for efficient retrieval.
    - Pagination used in listings and reports.

# Consistent UI

* Standard font, button, and color themes across all pages.
* Real-time field validation with standard error messages.

# Exception Handling

* Use of try-catch for backend processes.
* Friendly error messages; no internal details exposed.

# Validation and Input Handling

## Client-Side Validation

* + - Real-time validation on forms with helpful error prompts.

## Server-Side Validation

* + - All user inputs are validated again on the server before saving.

## Error Feedback

* + - Inline error messages near the form fields for guidance.

# Data Management

## Data Integrity

* + - All transactions are tied to valid users.
    - Soft delete used for complaints and member data.

## Data Backup

* + - Daily automated backups configured.

## Audit Logs

* + - Log of major operations with timestamps maintained.

# Scalability & Maintainability

* Modular MVC architecture supports extensibility.
* Admin panel supports filtering, sorting, and bulk actions.

# Cross-Browser & Platform Compatibility

* Tested on Chrome, Firefox, Edge (desktop and mobile).
* Responsive UI supports desktop, tablet, and mobile views.

# Compliance and Usability

## Usability

* + - Tooltips, placeholders, and confirmation dialogs enhance usability.

## Compliance

* + - Follows general security and data privacy guidelines.