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User Catalog Management System

1. Introduction

1.1 Purpose

The User Management System (UMS) is a comprehensive solution designed to manage user data securely and efficiently. It incorporates features like role-based login, password hashing, email notifications, and advanced user data handling. The system ensures robust security, seamless user interaction, and effective administrative functionalities.

1.2 Intended Audience and Reading Suggestions

This documentation is intended for:

- Developers: To understand the system architecture and functionalities for further development or maintenance.
- System Administrators: To manage the system effectively.
- Testers: To validate the functionality and identify potential issues.
- Stakeholders: To comprehend the capabilities of the system.

1.3 Product Scope

The User Management System aims to streamline user data management with features such as:

- Secure authentication and authorization using Spring JWT.
- Role-based access control for Users and Admins.
- Password security using SHA-512 hashing.
- Email notifications to users when their data is added or updated by the admin.
- Advanced search, sorting, and PDF export functionalities.
- Restricted webpage access post-logout until re-login.

1.4 References

- Spring Framework Documentation: https://spring.io/docs
- JWT Documentation: https://jwt.io
- SHA-512 Hashing: https://www.ietf.org/rfc/rfc6234.txt

2. Overall Description

2.1 Product Perspective

The UMS is a standalone web application built using Spring Boot, designed to simplify user management tasks for administrators. It integrates with an email service for notifications and utilizes JWT for secure token-based authentication. The architecture follows modern design principles, ensuring scalability and maintainability.

2.2 Product Functions

The primary functions of the UMS include:

- User data management with CRUD operations.
- Authentication using Spring JWT.
- Role-based access control.
- Password hashing for enhanced security.
- Email notifications.
- Search, sort, and filter capabilities for user lists.
- PDF export of user data.
- Secure session management.

2.3 User Classes and Characteristics

- Admin: Can manage user data, view lists, and perform advanced actions like exporting data and sending notifications.
- User: Can access their data and perform limited interactions based on their role.
- System Auditor: Reviews logs and ensures compliance with security protocols.

2.4 Operating Environment

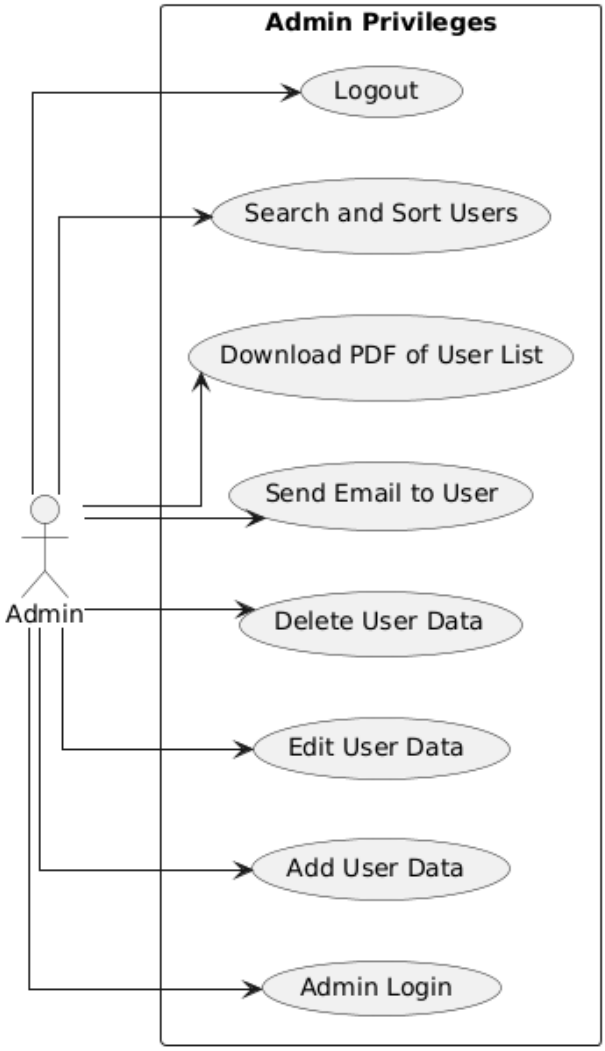
- Backend: Spring Boot framework.
- Frontend: Any web browser supporting modern standards (e.g., Chrome, Firefox).
- Database: Relational database (e.g., MySQL or PostgreSQL).
- Email Service: SMTP-compatible email server.
- Server Environment: Linux-based servers for deployment.

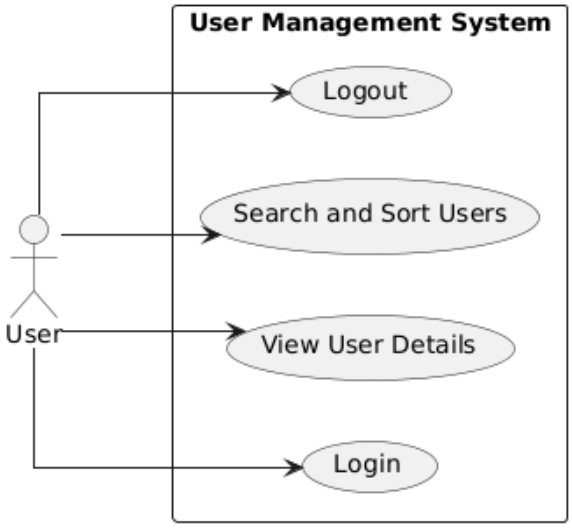
2.5 Design and Implementation Constraints

- Follows RESTful API principles.
- Secure password handling using SHA-512.
- Limited to two roles: Admin and User.
- System scalability for future integration with external systems.

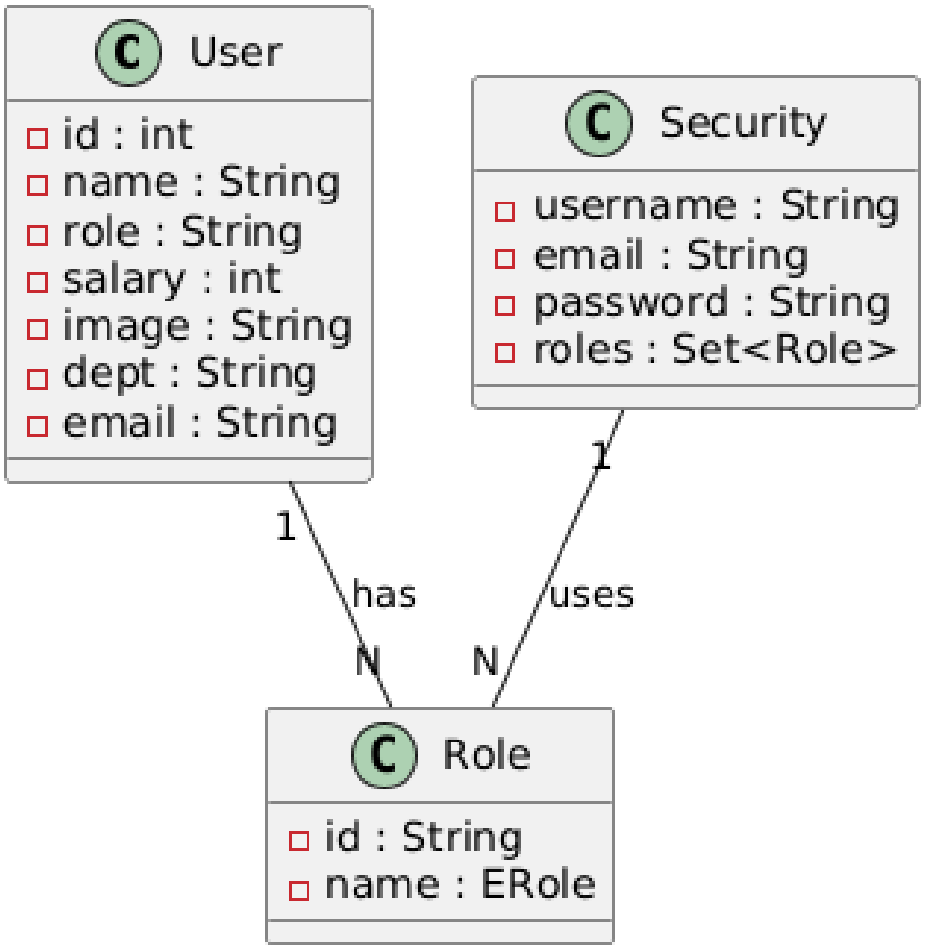
2.6 UML Diagrams:

Use Case Diagram :-

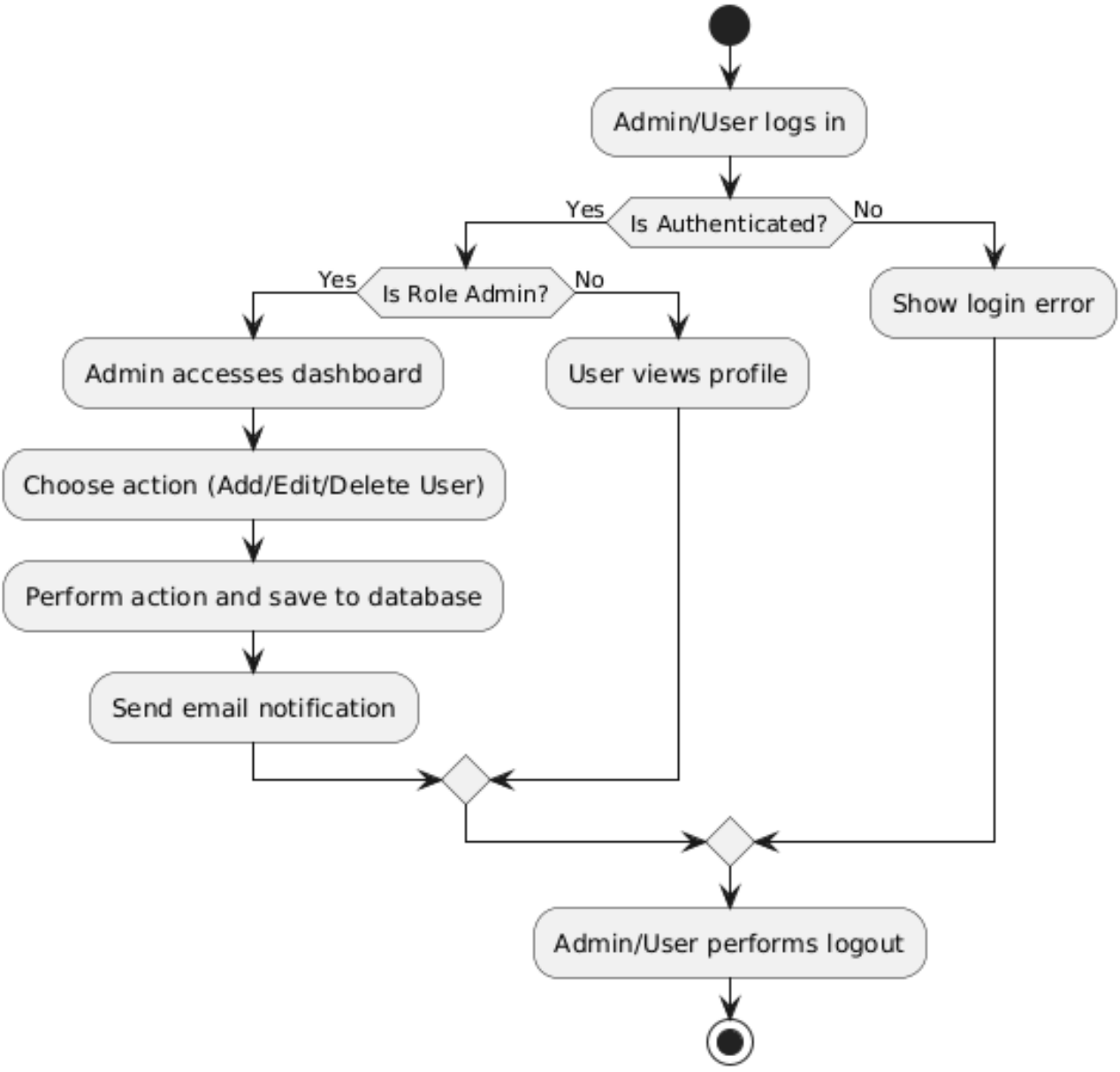




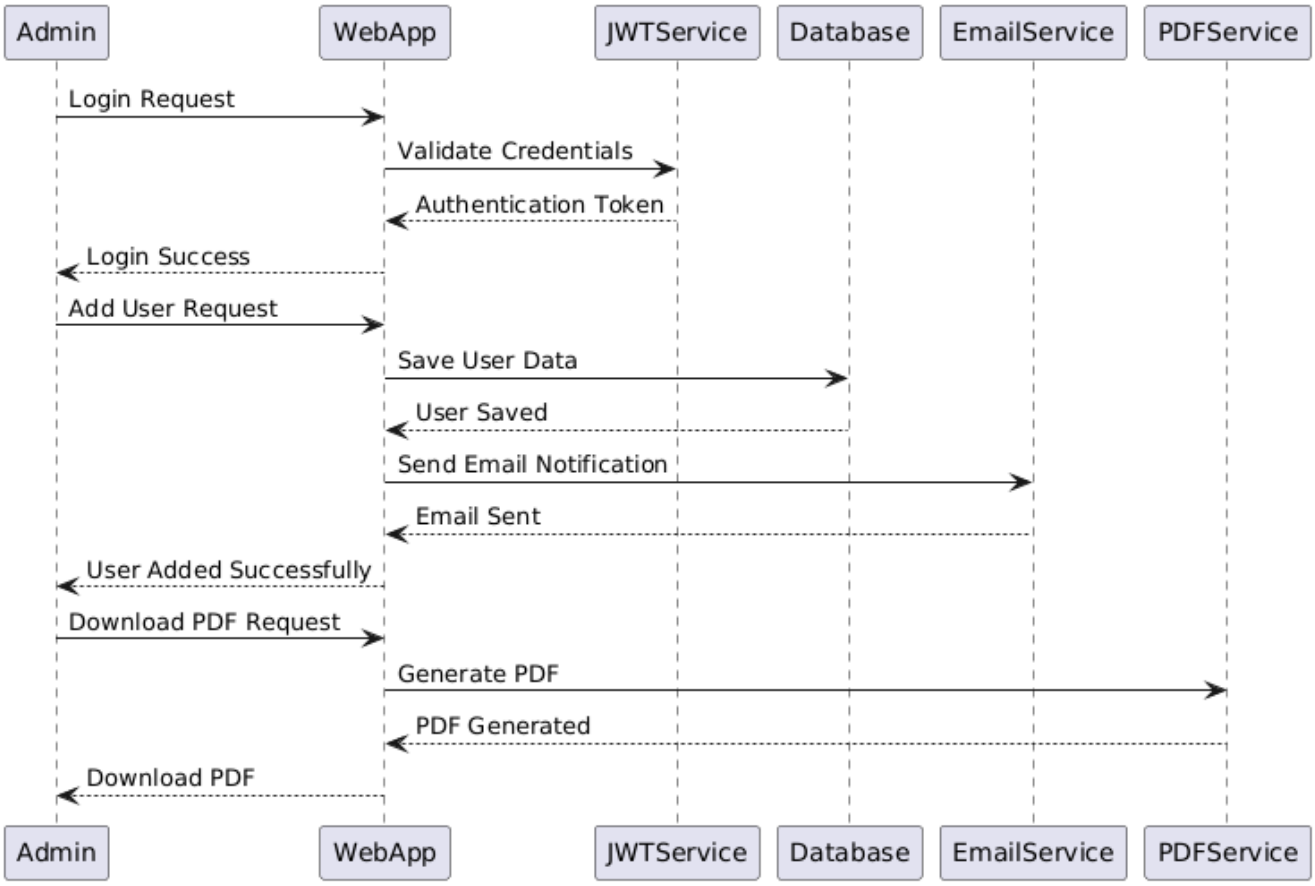
Class Diagram :-



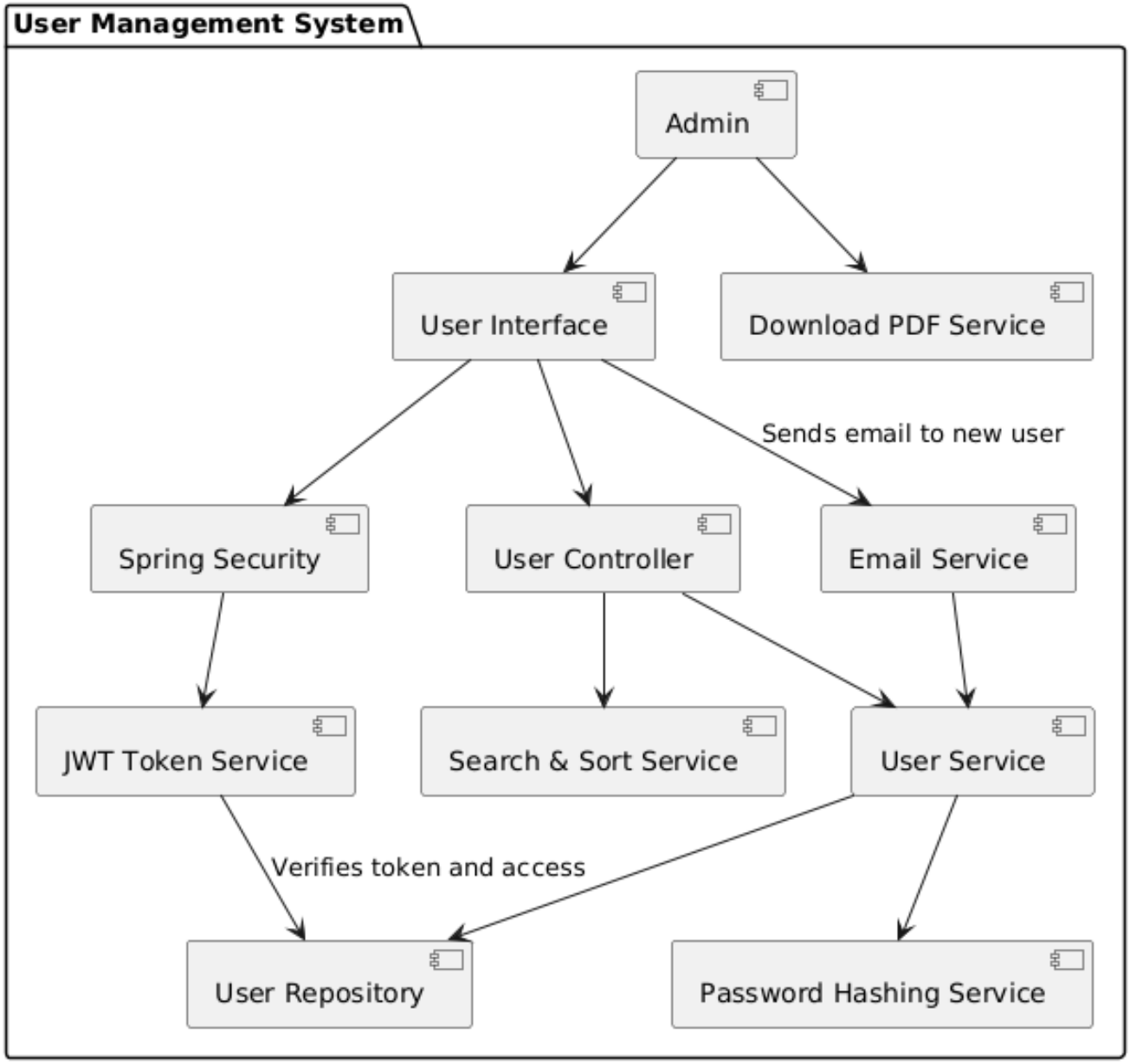
Activity Diagram :-



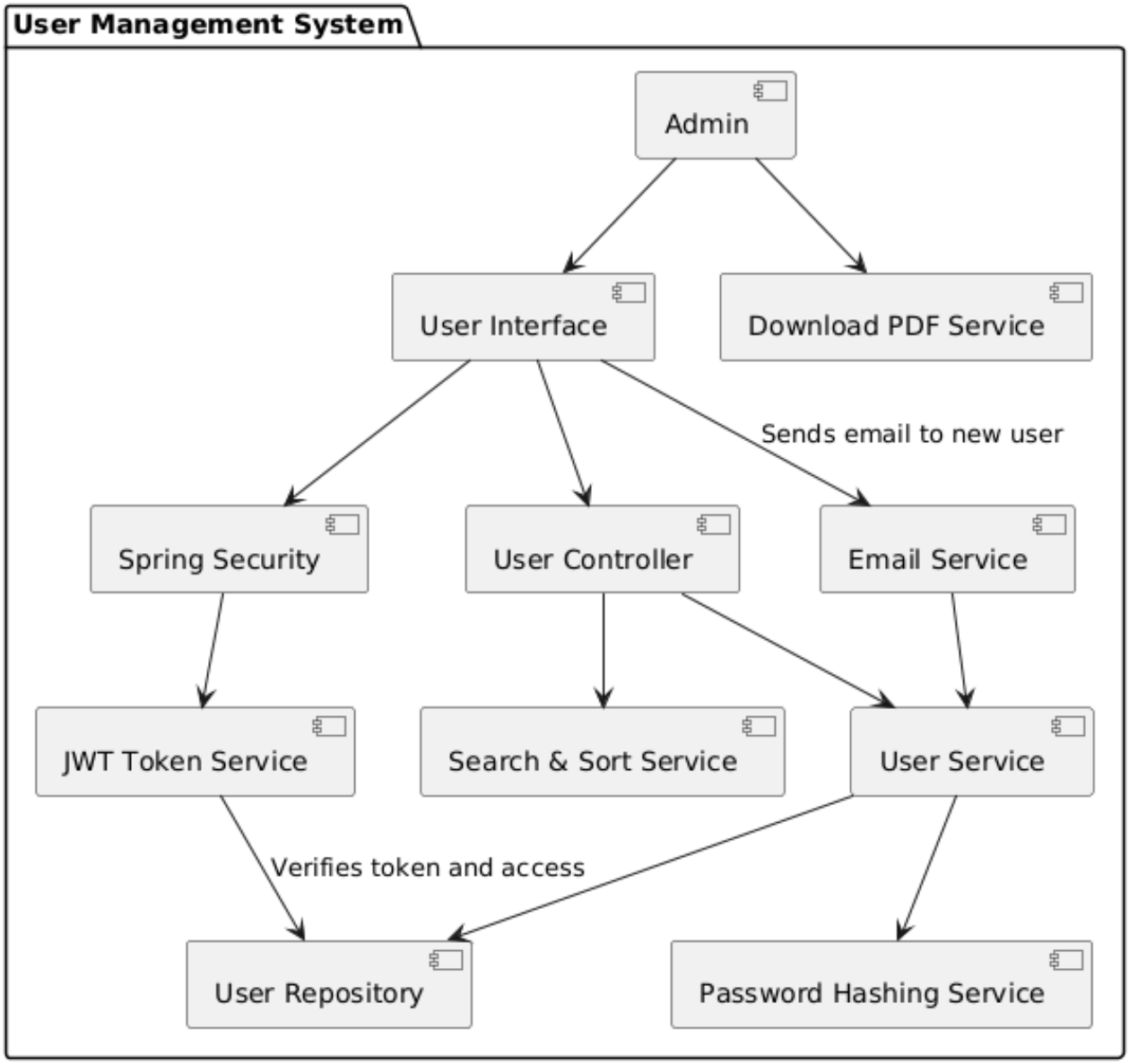
Sequence Diagram :-



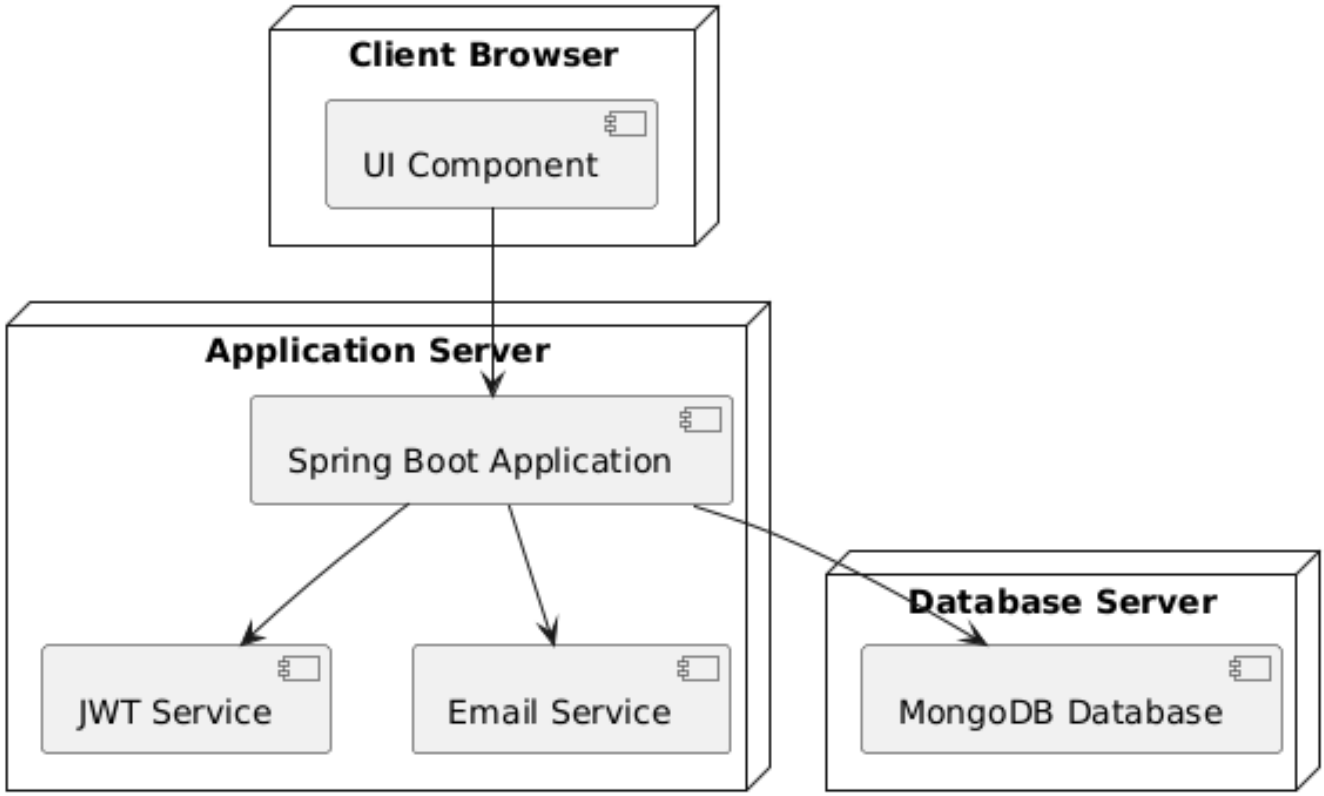
Component Diagram :-



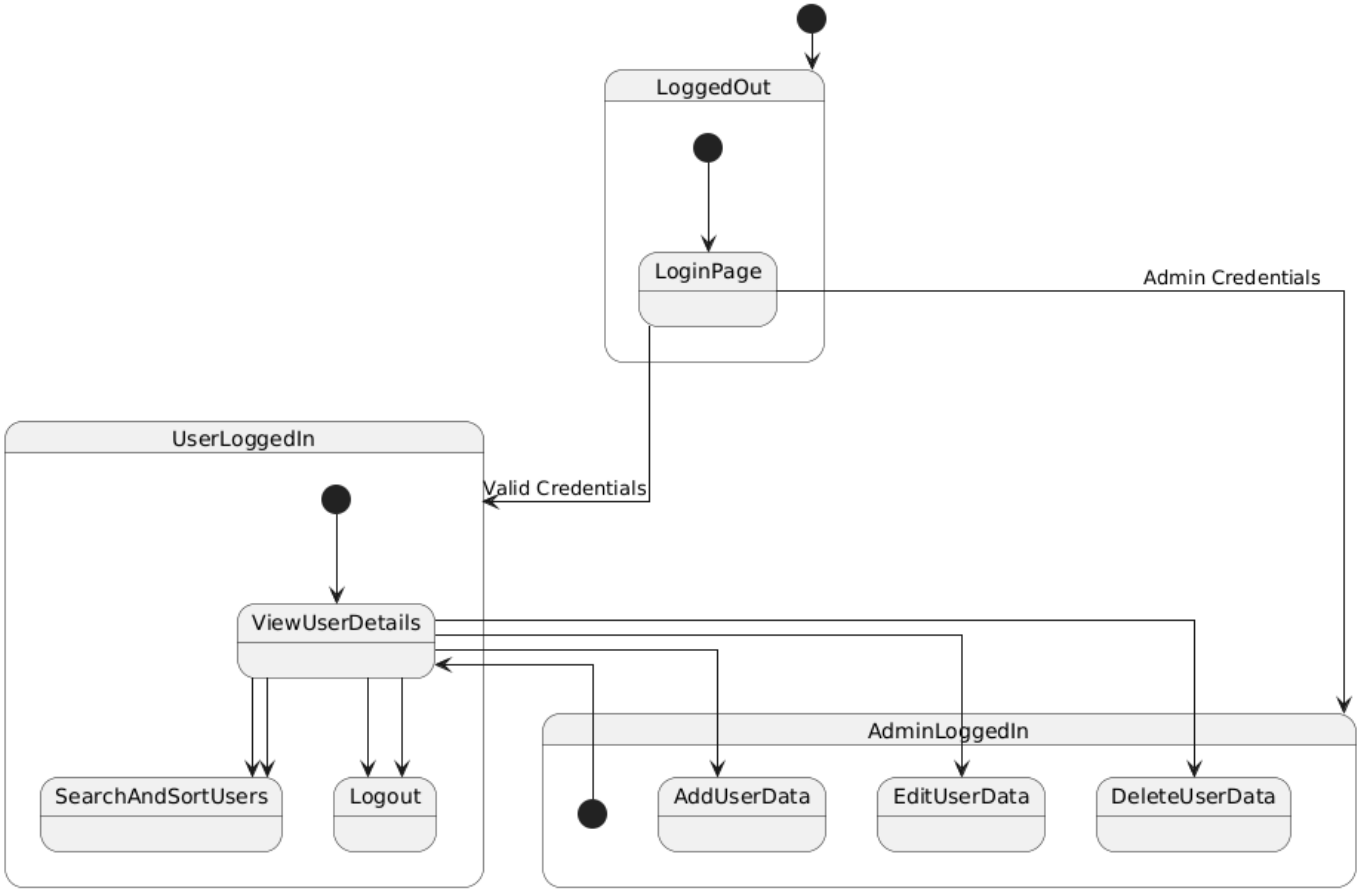
ER Diagram :-


User Management System
Admin
User Interface
Download PDF Service
Sends email to new user
Spring Security
User Controller
Email Service
JWT Token Service
Search & Sort Service
User Service
Verifies token and access
User Repository
Password Hashing Service

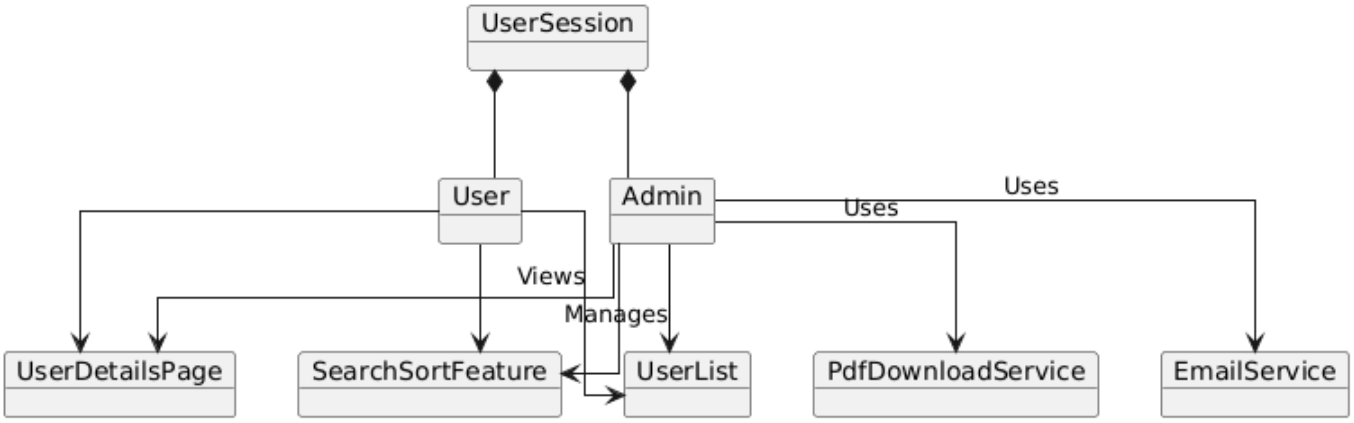
Deployment Diagram :-



State Diagram :-



Object Diagram :-



3. External Interface Requirements

3.1 User Interfaces

- Login page with role-based access.
- User dashboard displaying relevant user information.
- Admin dashboard with advanced functionalities like search, sort, and export.
- Error pages for unauthorized access and system errors.

3.2 Software Interfaces

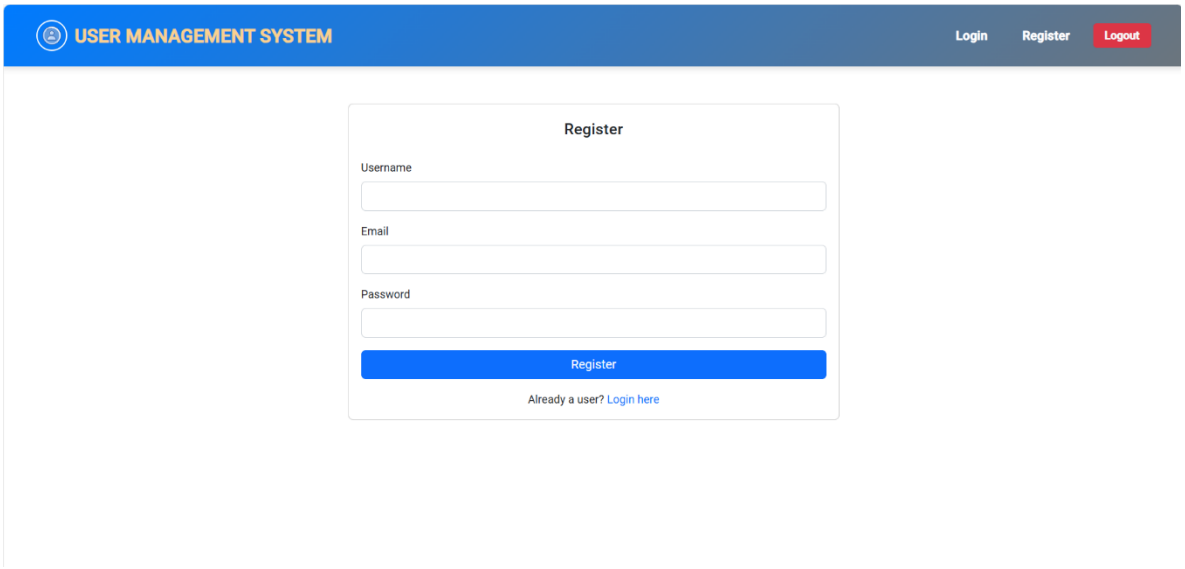
- JWT for authentication and authorization.
- Database for storing user and role information.
- SMTP for email notifications.
- Integration with third-party libraries for PDF generation and password hashing.

3.3 Hardware Interfaces

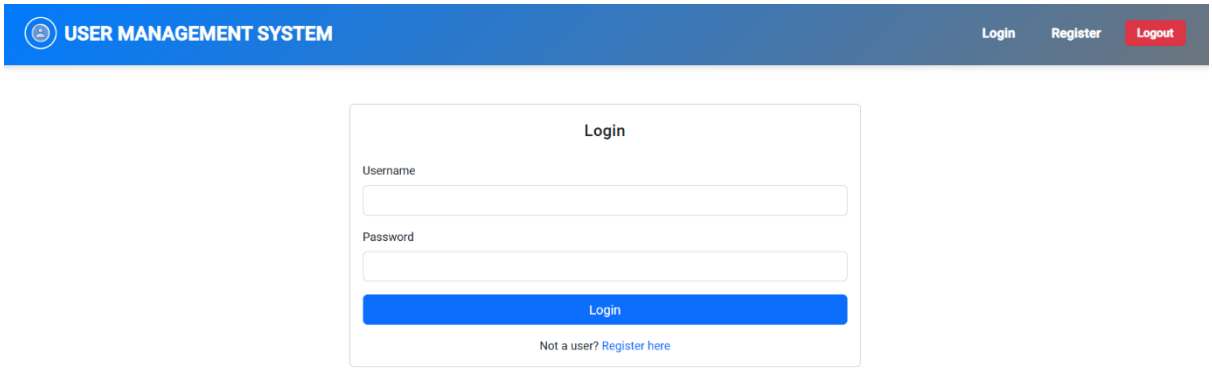
- Server requirements include 4 CPU cores and 8GB RAM for optimal performance.
- Database server with at least 100GB storage capacity for user records.

3.4 Communication Interfaces

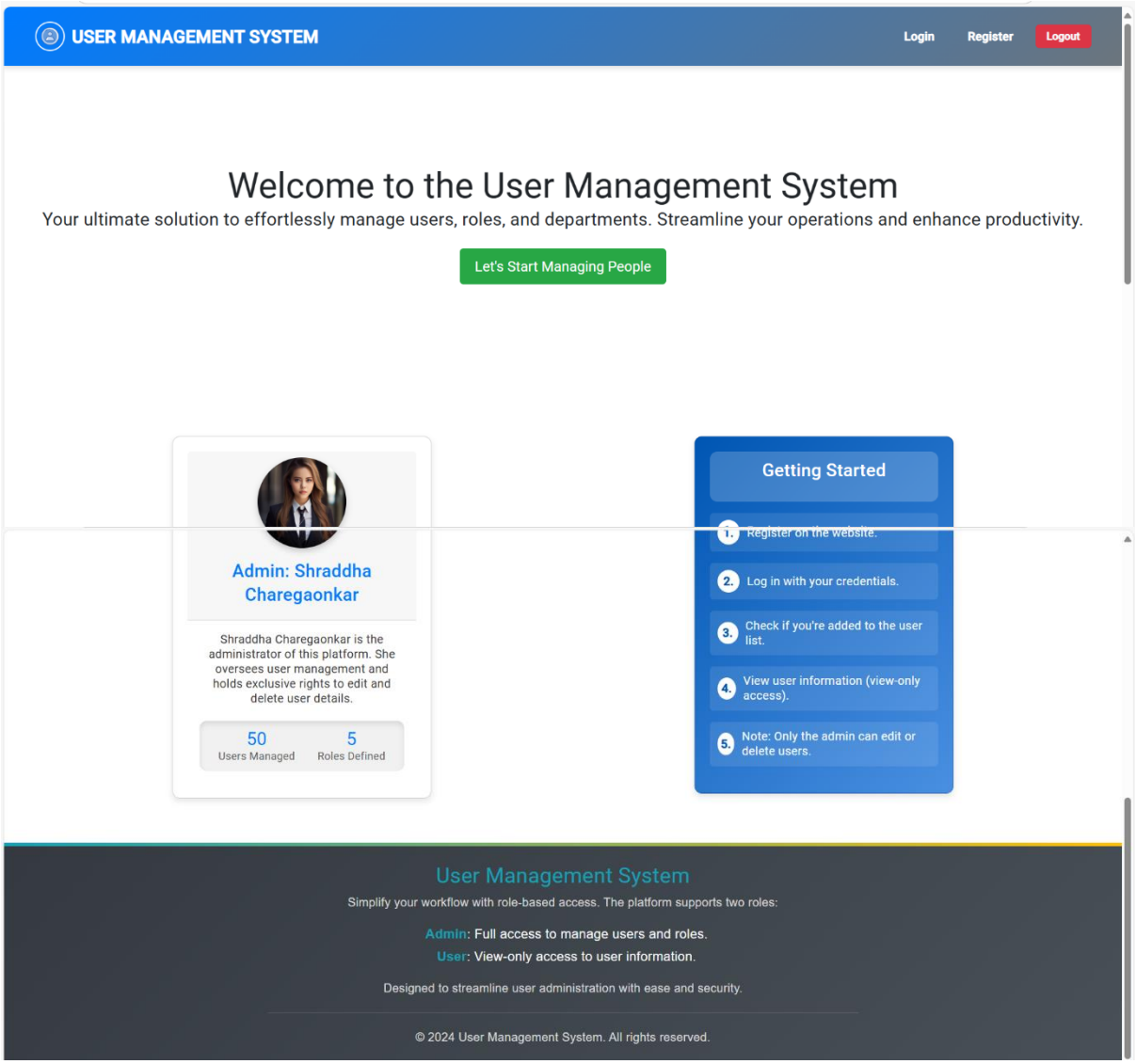
- HTTP/HTTPS protocols for client-server communication.
- Secure connections for email notifications.



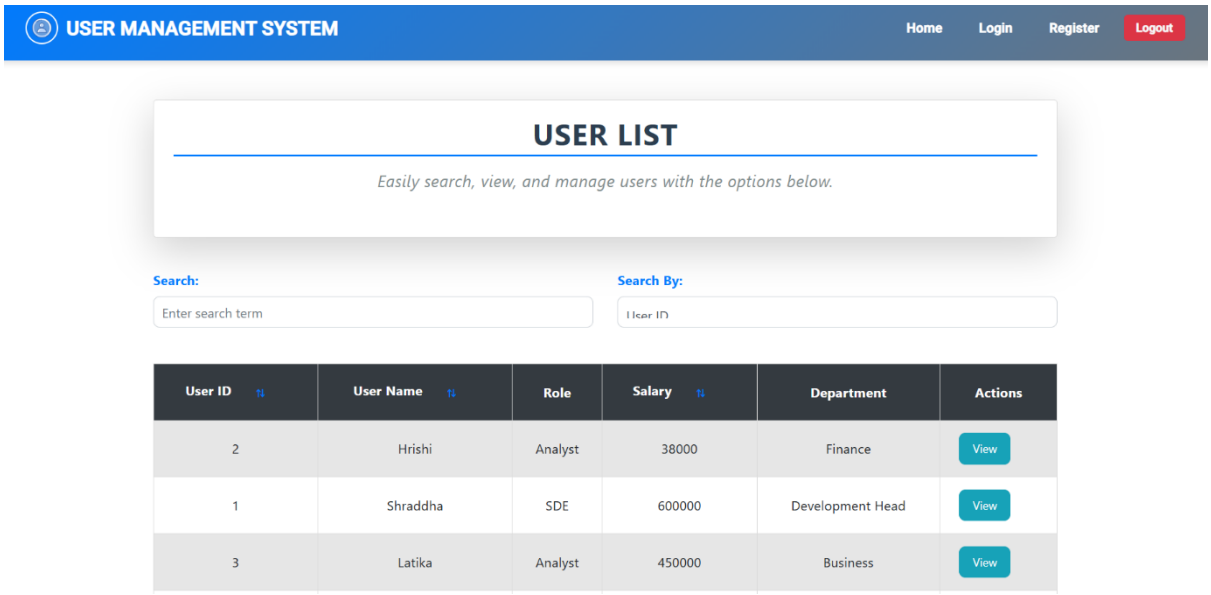
Register



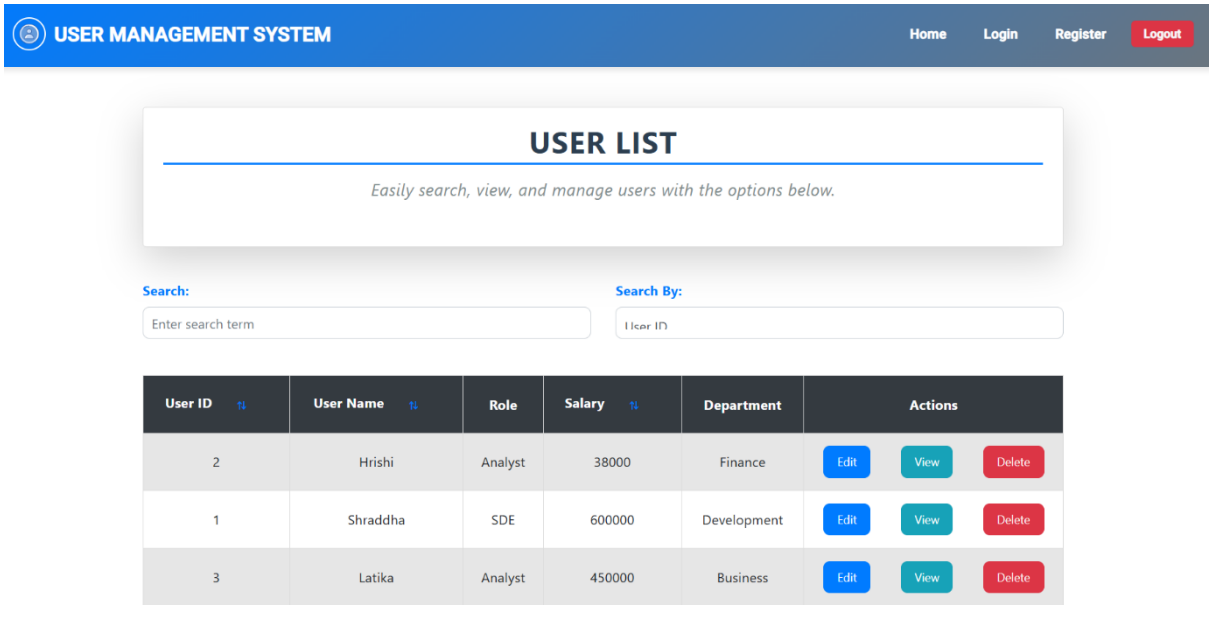
Login


USER MANAGEMENT SYSTEM
Login
Register
Logout
Welcome to the User Management System
Your ultimate solution to effortlessly manage users, roles, and departments. Streamline your operations and enhance productivity.
Let's Start Managing People
Admin: Shraddha Charegaonkar
Shraddha Charegaonkar is the administrator of this platform. She oversees user management and holds exclusive rights to edit and delete user details.
50
Users Managed
5
Roles Defined
Getting Started
1. Register on the website.
2. Log in with your credentials.
3. Check if you're added to the user list.
4. View user information (view-only access).
5. Note: Only the admin can edit or delete users.
User Management System
Simplify your workflow with role-based access. The platform supports two roles:
Admin: Full access to manage users and roles.
User: View-only access to user information.
Designed to streamline user administration with ease and security.
© 2024 User Management System. All rights reserved.

Front Page



Home Page :-User View



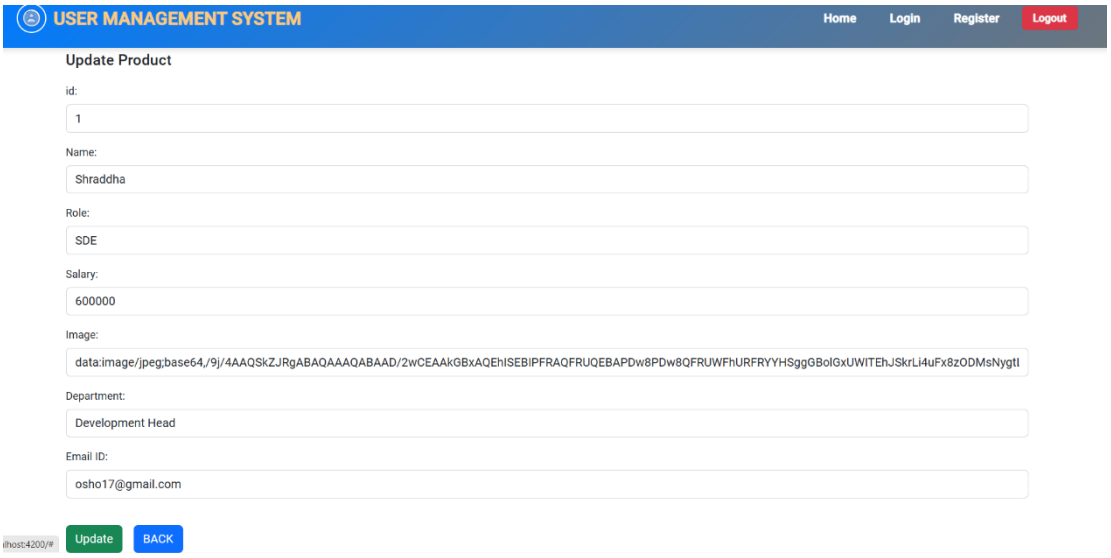
Home Page :- Admin View 1

User ID	User Name	Role	Salary	Department	Actions
2	Hrishi	Analyst	38000	Finance	Edit View Delete
1	Shraddha	SDE	600000	Development Head	Edit View Delete
3	Latika	Analyst	450000	Business	Edit View Delete
4	Suraj	SDE	500000	Development	Edit View Delete

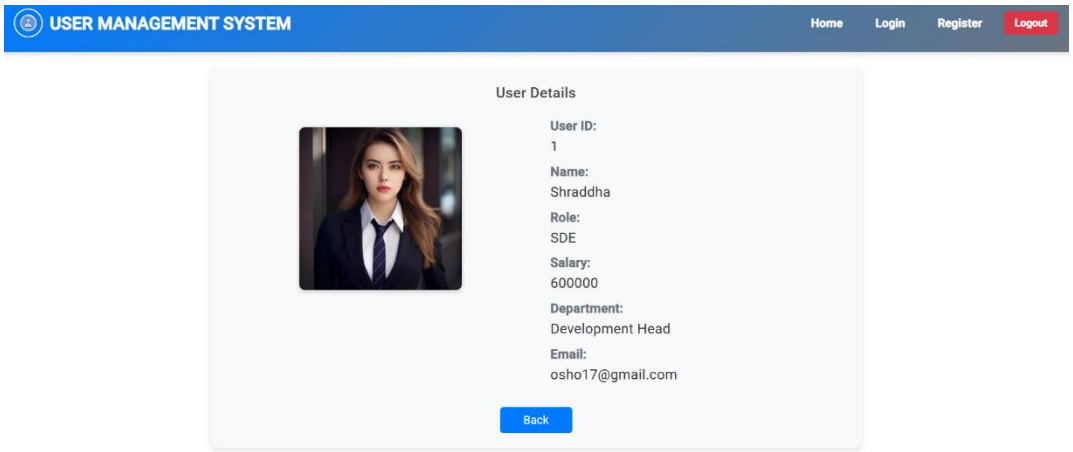
Add New User

Download PDF

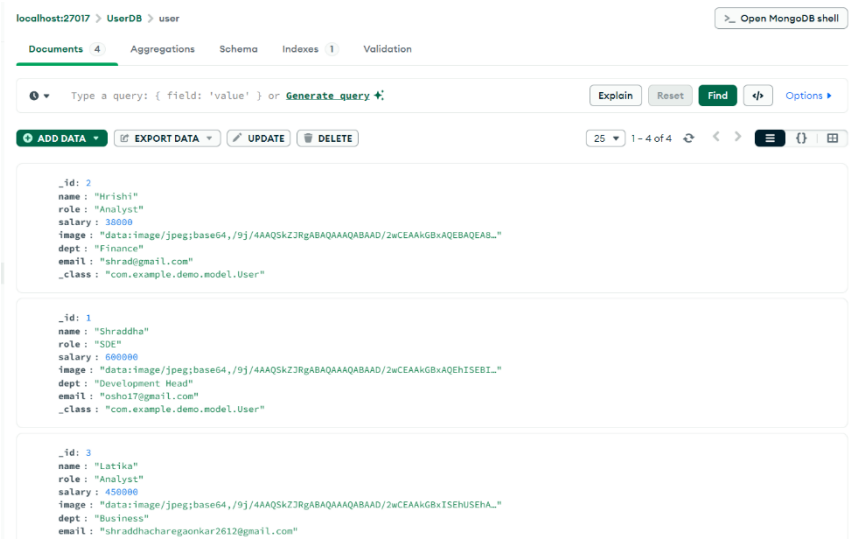
Home Page :- Admin View 2



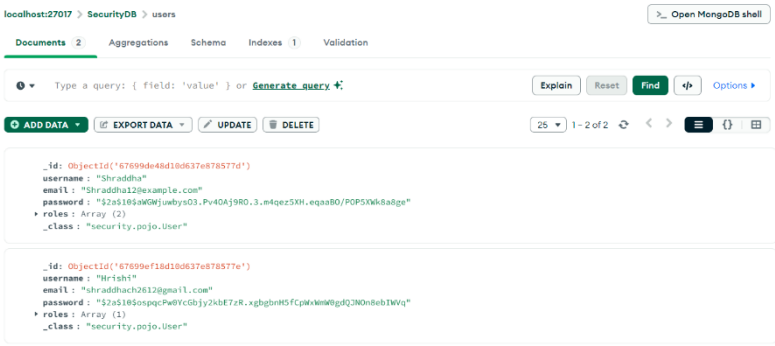
Edit Page



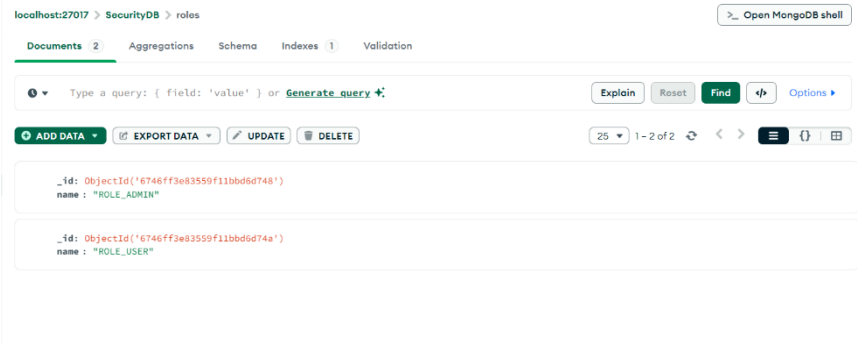
View Page



User Database – user collection



Security Database – users collection



Security Database – roles collection

4. System Features

4.1 System Feature 1: Secure Authentication and Authorization

- Spring JWT ensures token-based login.
- Role-based access control for Admin and User roles.
- Supports session expiration and token refresh mechanisms.

4.2 System Feature 2: Password Security

- User passwords are hashed using SHA-512 before storage.
- Enhances security by preventing password exposure.
- Includes validation for password strength.

4.3 System Feature 3: Email Notifications

- Admins can notify users via email when their data is added or updated.
- Uses a secure SMTP connection.
- Customizable email templates for various notifications.

4.4 System Feature 4: Data Management and Accessibility

- Admins can search, sort, and filter user data based on multiple criteria.
- Users can view their data securely.
- Provides pagination for efficient data handling.

4.5 System Feature 5: PDF Export and Session Management

- Admins can export user lists to PDF format.
- Users are restricted from accessing pages post-logout until re-login.
- Supports audit logging for session activity.

4.6 System Feature 6: Advanced Search and Sorting

- Multi-criteria search functionality for user data.
- Sorting options by name, role, department, and salary.
- Filters for date ranges and role-specific data.

4.7 System Feature 7: Role Management

- Admins can assign or modify roles for users.
- Supports the addition of new roles for future scalability.

4.8 System Feature 8: Logging and Monitoring

- Tracks all system activities for security audits.
- Logs user login/logout events and data changes.
- Monitoring dashboards for admin oversight.

4.9 System Feature 9: Error Handling

- Displays user-friendly error messages for system issues.
- Detailed error logs for debugging and resolution.

5. Other Nonfunctional Requirements

5.1 Performance Requirements

- The system should handle up to 1000 concurrent users.
- Email notifications should be sent within 5 seconds of triggering.
- PDF export should process lists of up to 10,000 records within 10 seconds.

5.2 Scalability Requirements

- System should allow integration with additional authentication methods like OAuth.
- Supports scalability for databases with millions of user records.

5.3 Security Requirements

- Ensures data encryption during transmission and at rest.
- Implements measures to prevent common vulnerabilities like SQL injection and CSRF.

5.4 Business Rules

- Only Admins can manage user data and perform advanced actions.
- Users must have unique email IDs for account creation.
- Passwords must meet complexity requirements.
- System must comply with GDPR and similar data protection regulations.

5.5 Availability Requirements

- System uptime should be at least 99.9%.
- Scheduled maintenance should be announced 24 hours in advance.

6. Appendices

6.1 Glossary

- JWT: JSON Web Token, a compact token format used for secure authentication.
- SHA-512: A cryptographic hash function used for password security.
- SMTP: Simple Mail Transfer Protocol, used for email communications.
- CRUD: Create, Read, Update, Delete operations.

6.2 Future Enhancements

- Integration with mobile applications.
- Support for multi-factor authentication.
- Real-time user activity monitoring.

6.3 References

- Spring Boot Documentation: https://spring.io/projects/spring-boot
- SHA-512 Algorithm: https://en.wikipedia.org/wiki/SHA-2
- PDF Libraries: https://pdfbox.apache.org/