

Project Proposal

Secure User Authentication System Using Java

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1. Project Title

Secure User Authentication System Using Object-Oriented Programming in Java

2. Project Purpose and Problem Statement

The purpose of this project is to develop a secure, object-oriented user authentication system using Java. This system will allow users to register, log in, and manage access securely.

Problem Statement: Many systems today lack basic authentication security, leading to vulnerabilities like data breaches and unauthorized access.

Importance of OOP: OOP ensures modularity and maintainability for scalable security implementations.

3. Project Goals and Key Functionalities

Goals:

- Secure authentication system
- Password encryption
- Session and access control

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Functionalities:

- User Registration
- User Login/Logout
- Input validation
- GUI and error handling

4. Tools and Technologies

Programming Language: Java

Frameworks: Java Swing

Encryption: Java Security / Apache Commons Codec

Database: MySQL / SQLite

5. Application of OOP Principles

Encapsulation: Private fields, getters & setters

Inheritance: Base class 'User', subclasses like 'AdminUser'

Polymorphism: Method overloading and overriding

Abstraction: Interface 'Authenticator' for authentication logic

6. Project Timeline

Requirement Analysis - 2 Days

System Design - 3 Days

Implementation - 10 Days

Testing & Debugging - 3 Days

Deployment - 2 Days

7. Final Product and Usefulness

The final product will be a Java-based desktop application with secure login features, password hashing, and session handling. It will help prevent unauthorized access and ensure secure authentication.

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8. Conclusion

This project demonstrates how OOP can be effectively used to build a secure and scalable authentication system. It addresses real-world security needs and showcases best practices in Java programming.

9. References

- Oracle Java Docs: <https://docs.oracle.com/javase/8/docs/>
- Apache Commons Codec: <https://commons.apache.org/>
- OWASP Guide: <https://cheatsheetseries.owasp.org/>
- MySQL Docs: <https://dev.mysql.com/doc/>