Project Proposal
LiveDoc
CS9053 - Spring 2025

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Project Overview

We propose to develop a real-time collaborative text editor that allows multiple users to simultaneously edit documents, similar to Google Docs but with a focus on implementing core Java concepts and distributed systems principles.

Key Features

1. User Authentication System
   a. Secure login and registration
   b. Session management
   c. Role-based access control
2. Document Management
   a. Create, open, and save documents
   b. Document sharing capabilities
   c. Version history tracking
3. Real-time Collaboration
   a. Simultaneous editing by multiple users
   b. Live cursor tracking
   c. Conflict resolution for concurrent edits

Advanced Java Concepts (Meeting Course Requirements)

1. Multi-threading
   a. Handle multiple client connections
   b. Manage concurrent document edits
   c. Background tasks for auto-saving and synchronization
2. Networking
   a. Client-server architecture
   b. WebSocket implementation for real-time updates
   c. REST API endpoints for document operations
3. Database Integration
   a. Store user information and documents
   b. Maintain document revision history

        c.   Handle concurrent database operations
4. GUI Development
        a.   Modern user interface using Java frameworks
        b.   Real-time updates without page refresh
        c.   Responsive design for better user experience

Technical Challenges

1. Maintaining consistency across multiple users
2. Handling network latency and disconnections
3. Implementing efficient conflict resolution
4. Ensuring data persistence and recovery
5. Managing concurrent access to shared resources

Learning Objectives

1. Practical implementation of advanced Java concepts
2. Understanding distributed systems challenges
3. Experience with real-time data synchronization
4. Working with modern Java frameworks and tools

Goal

1. Multiple users can edit documents simultaneously
2. Changes are reflected in real-time
3. System maintains data consistency
4. Robust error handling and recovery
5. Smooth and responsive user experience

This proposal outlines our plan to create a collaborative text editor that demonstrates our understanding of advanced Java concepts while creating a practical and useful application.