Project Title

Personalized Recommendation Engine (Media) Web App

Sprint 3 Documentation

This documentation outlines the progress and deliverables achieved during Sprint 3 of the Personalized Recommendation Engine project. Building upon the foundations established in earlier sprints, the team has successfully implemented the first version of the recommendation system and integrated live music playback features.

Project Overview

The goal of this project is to create a personalized web-based media recommendation platform that suggests songs, videos, and later movies based on user preferences and behavioral patterns. By analyzing user history and feedback, the system generates accurate and meaningful recommendations that reflect individual interests.

Problem Statement

Students and everyday users spend significant time searching for entertainment content that matches their preferences. This system aims to reduce that effort by providing an AI-powered recommendation engine that delivers personalized media suggestions from sources such as YouTube.

Intended Users

- Students and young adults
- Music and movie enthusiasts
- General users seeking personalized media recommendations

Sprint 3 Goals and Objectives

The focus of Sprint 3 was implementing and testing the core recommendation engine and YouTube connectivity. The key objectives were:

- Integrate the Two Tower Recommendation Model for personalized suggestions.
- Connect the recommendation engine to the YouTube API for direct music playback.
- Display recommended songs dynamically in the dashboard recommendation card.
- Begin development of a dataset for future movie recommendations and user behavior analysis.

Sprint 3 Deliverables

- Functional music recommendation engine using the Two Tower Algorithm.

- YouTube API integration allowing playback directly within the app.
- Backend enhanced with Gemini API for contextual understanding and semantic similarity scoring.
- Updated user interface displaying playable recommended songs.
- Early dataset preparation for user behavioral analysis.

Planned for Next Sprint (Sprint 4)

- Add movie recommendation capabilities using larger and more detailed datasets.
- Collect and analyze user behavior data for deeper personalization.
- Optimize backend performance with Gemini and Two Tower hybrid processing.
- Extend database structure to support user activity logs and feedback data.
- Improve model accuracy with retraining and testing.

Tools and Technologies

- Frontend: HTML, CSS, JavaScript (served through Express)
- Backend: Node.js with Express and Gemini integration
- Database: Firebase or SQLite
- AI Model: Two Tower Recommendation Algorithm combined with Gemini
- Authentication: bcrypt for secure password handling
- Project Management: Jira for tracking and GitHub for version control

Risks and Challenges

- Limited access to user history from YouTube due to privacy restrictions.
- Ensuring data quality and diversity in new datasets.
- Maintaining system performance as data volume increases.

Summary

By the end of Sprint 3, the project achieved a major milestone with the successful implementation of a working AI-based music recommendation engine connected to YouTube. The backend now combines the Two Tower model and Gemini to provide more intelligent and personalized results. These achievements set the foundation for future improvements in movie recommendations and behavioral data integration in upcoming sprints.