Modern Application Development 1

Project – Comprehensive Report

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# Project Overview

## Introduction

As an undergraduate student, I developed a music streaming app leveraging Flask, SQLAlchemy, and Python. The app aimed to provide users with robust playlist management, song interaction functionalities, and user account management.

## Objectives

- Implement a user-friendly platform for managing playlists, rating songs, and interacting with music content.

- Create a secure user authentication system and enable song rating functionalities.

# Application Structure

## Database Model

Utilizing SQLAlchemy, I structured the database with tables for Users, Songs, and Playlists, including an association table to manage many-to-many relationships efficiently.

## Flask Application

The app was structured using Flask Blueprints (`creator\_bp`, `user\_bp`, `playlist\_bp`) to manage distinct functionalities: user-specific actions, song operations, and playlist management.

# Database:

* Users have a one-to-many relationship with Song (one user can create multiple songs).
* Song has a many-to-one relationship with Users (each song is created by a single user).
* Users have a one-to-many relationship with Playlist (one user can create multiple playlists).
* Playlist has a many-to-one relationship with Users (each playlist is created by a single user).
* There is a many-to-many relationship between Song and Playlist connected via the **association** table.

# Implemented Functionalities

## User Management

- Users could register, log in, view profiles, and modify personal information.

- Song functionalities included reading lyrics and providing song ratings.

## Playlist Operations

- Users could create, edit, and delete playlists, adding songs to them as desired.

- Creators had specialized functionalities for playlist management and song addition.

# Challenges Faced and Solutions

## Technical Hurdles

Managing database relationships and routing logic posed challenges, necessitating a deep understanding of Flask's Blueprint system.

## Resolutions

I resolved these issues through meticulous debugging, consultation of Flask documentation, and strategic restructuring of routing.

# Future Enhancements

## Potential Improvements

Opportunities exist to enhance user interactions, improve playlist management features, and refine the user interface for a more intuitive experience.

## Future Expansion

Future expansion plans might involve implementing recommendation systems, enhancing social features, or integrating external APIs for enriched music suggestions.