TECHNICAL DOCUMENTATION

Spotify Playlist Curation Tool that transforms how users experience their music Libraries.
The tool analyzes users' existing playlists, generates dynamic categories based on song metadata and genres, and curates new, personalized playlists tailored to diverse listening preferences by leveraging LLM capabilities.

FUNCTIONS:

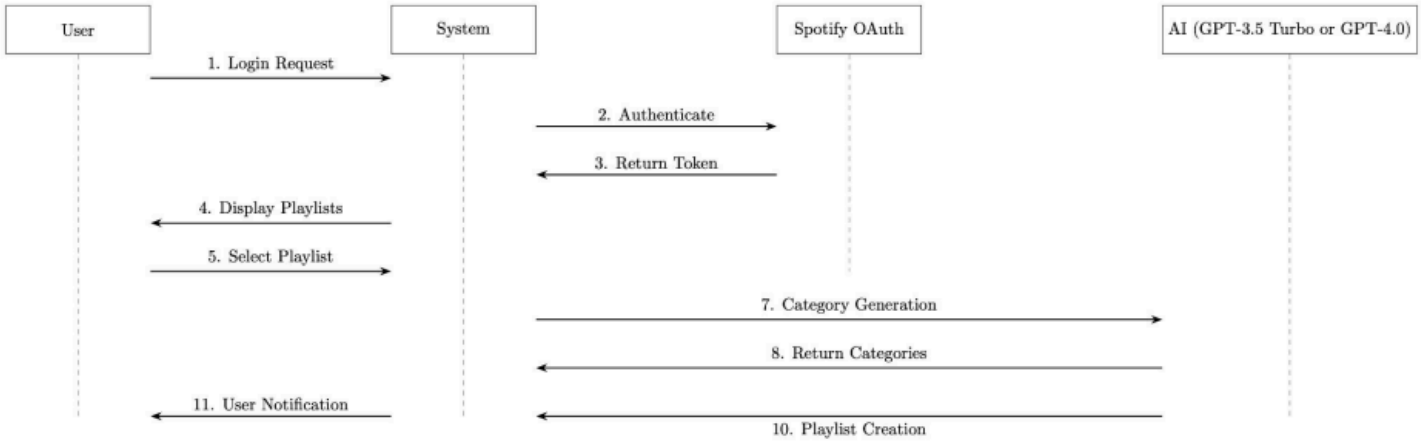
There are two key functionalities in the project:
1) Spotify Interaction : User Login and Playlist Selection
2) AI Interaction : Generating Categories and Curating Playlists

The functionalities have been implemented as such:

1. User Authentication:
    - Secure login with Spotify OAuth.
2. User Interface:
    - Dashboard to view and select playlists.
    - Options to set categories and initiate curation.
3. Generate Categories:
    - Scrape songs and metadata from playlists.
    - Analyze data for nuanced categorization.
    - Use LLMs (GPT-3.5 Turbo / GPT-4.0) for dynamic category generation.
    - Categorize songs based on AI analysis.
4. Playlist Creation:
    - Generate new playlists for each category.
    - Save curated playlists to user’s account.
5. Backend & Performance:
    - Flask server:manage API calls, data processing, and interactions with Spotify's services.

SEQUENCE FLOW:

The following is a sequence diagram detailing the technical flow of the project:



CODE DESIGN

The source code has been implemented following the architecture. The following is a breakdown of the technologies involved.

Front End / User Interface
● Technologies: HTML, CSS, JavaScript (React.js for dynamic content)
● Function: Provides the user interface through which users interact with the system, including login, playlist selection, and viewing curated playlists.
● Interaction: Communicates with the back end via RESTful API calls to display data and submit user requests.

Back End / Server
● Technologies: Flask (Python), Spotify Web API
● Function: Handles API requests, interacts with Spotify for data retrieval and playlist management, processes LLM requests, and manages database operations.
● Interaction: Serves as the middleware between the front end and both Spotify's services and our AI components.

AI / Machine Learning
● Technologies: OpenAI's GPT-3.5 Turbo and GPT-4.0 models
● Function: Generates categories based on playlist metadata and assigns songs to these categories to create new, curated playlists.
● Interaction: Receives song metadata from the back end, processes it to generate categories, and returns categorized song lists for playlist creation.