User Manual Overview of the Application's Functionality

The Movie Database Management System (DBMS) is designed to manage and analyse movie-related data efficiently. The application fetches data from The Movie Database (TMDB) API and stores it in a structured MySQL database. It includes several features and functionalities to help users interact with and analyse the stored data.

Key Features

1. **Database Schema Creation**
    - The application creates a well-structured database schema with tables for movies, genres, persons, movie genres, and movie cast.
    - Proper indexing and foreign key constraints are applied to ensure efficient query execution.
2. **Data Population**
    - The application fetches data from the TMDB API, including movie details, genres, and credits.
    - It populates the database with over 5,000 records, ensuring comprehensive data coverage.
3. **Full-Text Search Queries**
    - The application includes full-text search queries to find movies based on specific keywords in their overviews.
    - Example: Finding the top 5 movies mentioning 'gangster' in their overview with the highest average rating.
4. **Complex Queries**
    - The application includes complex queries involving nested subqueries, aggregations, and the EXISTS clause.
    - Example: Finding the top 5 most popular movies mentioning 'Action' in their overview, along with their genres and the number of actors in each movie.
5. **Query Execution**
    - The application provides a script to execute and demonstrate the implemented queries.
    - Users can run the script to see the results of the queries and understand the data analysis capabilities of the application.
6. **Database Optimizations**
    - The application includes proper indexing strategies to optimize query performance.
    - Indexes are created on columns frequently used in queries to ensure efficient data retrieval.

How to Use the Application

1. **Install Dependencies**
    - pip install -r requirements.txt
    - Ensure you have Python 3.11.4 and MySQL server installed.
    - Install the required Python libraries using the requirements.txt file.
2. **Create the Database**
    - python src/create_db_script.py
    - Run the script to create the database schema.
3. **Populate the Database**
    - python src/api_data_retrieve.py
    - Fetch and insert data from the TMDB API.
4. **Execute Queries**
    - Run the script to execute and demonstrate the queries:
    - python src/queries_execution.py