

Esonero Project Report

Cinema Database Management System

This report provides an overview of the Esonero project, which is a web-based Cinema Database Management System. The system allows users to query and manage a database of movies and directors.

1. Project Architecture

The project follows a microservices architecture with three main components:

1.1 Frontend

A web interface built with FastAPI and Jinja2 templates that allows users to interact with the system. It runs on port 8001 and communicates with the backend service.

1.2 Backend

A FastAPI service that handles business logic, database queries, and data processing. It runs on port 8003 and provides RESTful API endpoints for the frontend to consume.

1.3 Database

A MariaDB database that stores information about movies and directors. It contains two main tables: "movies" and "director".

2. Database Schema

2.1 Director Table

Contains information about film directors with the following columns:

- name (VARCHAR): The director's name (Primary Key)
- age (INT): The director's age

2.2 Movies Table

Contains information about movies with the following columns:

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- name (VARCHAR): The movie title (Primary Key with director)
- director (VARCHAR): The director's name (Foreign Key to director table)
- year (INT): The release year of the movie
- genre (VARCHAR): The movie's genre
- platform1 (VARCHAR): First streaming platform where the movie is available
- platform2 (VARCHAR): Second streaming platform where the movie is available

3. System Features

3.1 Database Schema Summary

Users can view the database schema structure through the `"/schema_summary"` endpoint, which returns a list of all tables and their columns.

3.2 Search Functionality

The system supports natural language queries through the `"/search/{query}"` endpoint. Users can ask questions like:

- "Elenca i film del 2010" (List movies from 2010)
- "Quali sono i registi presenti su Netflix?" (Which directors have movies on Netflix?)
- "Elenca tutti i film di fantascienza" (List all science fiction movies)
- "Quali film sono stati fatti da un regista di almeno 80 anni?" (Which movies were made by directors at least 80 years old?)
- "Quali registi hanno fatto più di un film?" (Which directors have made more than one movie?)

3.3 Add New Movies

Users can add new movies to the database through the `"/add"` endpoint. The data must be provided in a specific format: `"Title,Director,Director_Age,Year,Genre,Platform1,Platform2"`.

4. Deployment

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The project is containerized using Docker and can be deployed using Docker Compose. The docker-compose.yml file defines three services:

- frontend: Exposes port 8001
- backend: Exposes port 8003
- mariadb: Exposes port 3307 (mapped to internal 3306)

5. Testing

The project includes a test script (test_backend_esonero.py) that verifies the functionality of the backend API. The tests check:

- Database schema format
- Search functionality for different types of queries
- Adding new movies
- Error handling for invalid inputs

6. Conclusion

The Esonero project is a comprehensive Cinema Database Management System that demonstrates the use of modern web technologies and microservices architecture. It provides a user-friendly interface for querying and managing movie data, with support for natural language processing to interpret user queries.