Final Year Project 1

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Project Title: Universal Recommendation System

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Fyp Group 1

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Project Description:

Our group is developing a universal recommendation system to provide personalized recommendations to a large user base. This system is designed to help users find relevant items based on their preferences, behavior, and other factors. With the overwhelming amount of data and information available, it can be challenging for users to find what they need quickly and efficiently. Our recommendation system addresses this problem by offering personalized suggestions that save users time and effort while improving their overall experience.

Our system consists of four unique features: a content-based movie recommendation system, a book recommendation system using collaborative filtering, a music recommendation system using collaborative filtering and cosine similarity, and a fashion recommendation system based on deep learning CNN. The movie recommendation system is updated regularly with the latest movie data, ensuring that users receive up-to-date and relevant recommendations.

Each feature in our system has its own unique set of attributes, allowing us to provide users with highly personalized recommendations based on their individual preferences and behavior. The content-based movie recommendation system analyzes various attributes of each movie, such as genre, director, and actor, cast, crew to provide relevant recommendations. The book recommendation system using collaborative filtering considers attributes such as book title, author, genre, publication date, publisher and book rating. The music recommendation system using collaborative filtering and cosine similarity analyzes attributes such as title, artist, release

date, and score. Finally, the fashion recommendation system based on deep learning CNN considers attributes such as gender, article type, color, and category and product title. This level of personalization helps to improve user engagement, satisfaction, and ultimately enhances the user experience by providing relevant and personalized recommendations.

We are using Python, Django, and Flask for the backend and HTML and CSS for the front end of our recommendation system.

Project's Main Features:

This project aims to build a multiple-category recommendation system that consists of four features. These features include a content-based movie recommendation system, a book recommendation system, a music recommendation system, and a fashion recommendation system. Each feature will serve a unique purpose in providing personalized recommendations to the users.

1. Movie Recommendation System

The movie recommendation system will use content-based filtering to recommend movies similar to a given movie. The system will represent each movie as a vector and use cosine similarity to find movies that are similar to the input movie. The system will also display the top 250 movies based on their rating, which will be updated regularly using an API. The system will collect data on the movies, represent each movie as a vector, and use the updated data to retrain the model and predict the new movie ratings. Based on these predicted ratings, the system will sort and display the top 250 movies to the user.

2. Book Recommendation System

The book recommendation system using collaborative filtering will provide users with recommendations based on their input book name. To ensure the quality of recommendations, the system will only consider books that have received at least 250 votes from users in the dataset. By filtering out unpopular books, the system aims to recommend only the most popular and highly rated books to the user. This helps to recommend popular and highly-rated books that are more likely to meet the user's expectations and improve their experience.

3. Music Recommendation System

The music recommendation system employs a collaborative filtering technique that analyzes users' past behavior and preferences to recommend new songs. The system computes the similarity between a user's musical taste and other users' preferences using cosine similarity as the similarity metric.

Cosine similarity measures the cosine of the angle between two vectors, where each vector represents a user's musical preference. The closer the angle between the two vectors, the higher the cosine similarity score between them. The system then scores each candidate song based on how similar it is to the user's preference vector, and the system recommends songs with the highest scores.

In other words, if a song has a high cosine similarity score, it means that the song is highly correlated with the user's musical taste, and the user is more likely to find it interesting. The system recommends the songs with the highest scores to the user, as they are more likely to match the user's interests.

4. Fashion Recommendation System

The fashion recommendation system based on deep learning CNN utilizes a reverse image search approach to recommend visually similar products to the user. The user can upload an image of a fashion-related item, such as suits, watches, shoes, shirts and so on. The system processes the image using a convolutional neural network (CNN) to identify the features and patterns in the picture.

Then, the system searches its database for products that have similar features and patterns to the user's uploaded image. It recommends a maximum of 5 products that are visually similar to the user's image. This approach of the fashion recommendation system is called reverse image search as it uses the image as a search query to find similar products.

This fashion recommendation system is particularly useful for users who want to find similar designs or styles to the one in their image. By using deep learning CNN, the system can accurately identify the features and patterns in the image and find visually similar products, making it easier for users to discover fashion items that match their preferences.

Functional Requirements:

- The system recommends movies similar to the input movie using content-based filtering.
- A regularly updated list of the top 250 movies, ranked according to user ratings and obtained via an API, is displayed by the system.
- The book recommendation system should be able to provide users with book recommendations based on their input book name.
- Only books that have received at least 250 votes from users in the dataset are considered by the book recommendation system.
- The music recommendation system should compute the similarity between a user's musical taste and other users' preferences using cosine similarity as the similarity metric.
- To suggest new songs to users based on their past behavior and preferences, the music recommendation system uses collaborative filtering.

- The fashion recommendation system should be able to recommend visually similar products to the user based on their uploaded image.
- By analyzing uploaded images, the fashion recommendation system suggests visually similar products to users, utilizing deep learning CNN.
- A maximum of five visually similar products to the user's uploaded image is recommended by the fashion recommendation system.

Non-Functional Requirements:

- The system should be highly personalized and provide recommendations based on individual preferences and behavior.
- The system has the ability to handle a large user base and is designed to be scalable.
- Frequent updates to movie data can be accommodated by the system, which can be retrained as needed.
- A user-friendly interface is provided by the system to ensure ease of use and a superior user experience.
- The system should provide recommendations quickly and efficiently.