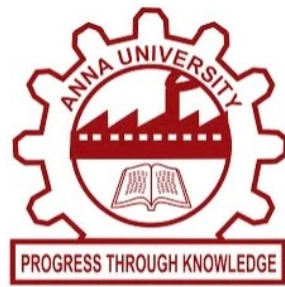


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Personalised Content Recommendation Project

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Personalised Content Recommendation in Python

Abstract :

This project aims to develop a personalised content recommendation system using data science techniques and Python programming. The system is designed to enhance user experience and engagement by suggesting relevant content based on user's past preferences and behaviour. The methodology involves implementing collaborative filtering algorithms, including user-based and item-based approaches, as well as content-based filtering techniques. Python data science libraries are used to build the content recommendation system.

Introduction :

In today's digital age, the abundance of content available online has led to a growing need for effective content recommendation systems. These systems play a crucial role in enhancing user experience by providing personalised recommendations tailored to individual preferences and behaviours. A content recommendation system is designed to provide suggestions that are specifically suited to each user's unique tastes, interests, and past interactions. From streaming platforms recommending movies based on viewing history to e-commerce sites suggesting products based on past purchases, content recommendation systems have become integral to many online platforms.

Methodology :

Steps involved in building a content recommendation system :

1. Data Acquisition and Preprocessing :

- Gather data on user interactions with content . eg : ratings, views, purchases and content features such as genres, categories, tags
- Once collected, the data needs to be cleaned and formatted into a structure that can be easily analysed.
- Preprocess the data by handling missing values, encoding categorical variables, and scaling numerical features if needed.

2. Choose a recommendation algorithm :

- Explore the dataset to understand the distribution of data, relationships between variables, and identify patterns or trends.
- To build a recommendation system, a best algorithm is needed. There are several algorithms :

1. Collaborative filtering :

Collaborative filtering looks at similarities between users and items to make recommendations. This works well for sites like Netflix where users rate content.

2. Content-based filtering :

Content-based filtering recommends items similar to what a user liked in the past, based on item metadata. This is common on shopping sites.

3. Hybrid approaches :

Hybrid approaches combine both collaborative and content-based filtering.

- The choice depends on the type of data available and the use case.

3. Train and test a model :

- Split the dataset into training and testing sets to train the recommendation models.
- The prepared data is then used to train a machine learning model based on the chosen algorithm.
- Common Python libraries used include Surprise for collaborative filtering and scikit-learn for content-based models.
- The model is tested on holdout data to evaluate its accuracy before final deployment.

4. Evaluation :

- Monitor the performance of the deployed model using user feedback.
- Continuously update and retrain the model with new data to improve recommendation accuracy and adapt to evolving user preferences.
- Based on a user profile and past interactions, the trained model will predict relevant content for recommendation. This ensures users discover content they're likely to enjoy.

Existing Work on Personalised Content Recommendation :

There is a vast body of existing work on personalised content recommendation across various domains. Few notable examples are listed below

1. Netflix :

Netflix: Netflix's recommendation system is one of the most famous examples of personalised content recommendation.

It uses a combination of collaborative filtering (both user-based and item-based), content-based filtering, and advanced machine learning models to suggest movies and TV shows based on user preferences, viewing history, ratings, and interactions.

2.E-Commerce Platforms :

E-commerce sites like eBay, Alibaba, and Flipkart ,Amazon use recommendation systems to suggest products to users based on their purchase history, browsing behaviour, search queries, and product preferences. They employ collaborative filtering, content-based filtering, and hybrid approaches to improve product recommendations.

3.Spotify :

Spotify's music recommendation system leverages collaborative filtering algorithms to recommend songs and playlists tailored to each user's music preferences, listening history, liked tracks, and genre preferences. It also uses content-based features like song attributes and audio analysis to improve recommendations.

4.Social Media :

Platforms like Facebook, Instagram, and Twitter use personalised recommendation systems to suggest posts, articles, ads, and content based on user interests, social connections, engagement history, and behaviour patterns.

These examples highlight the diversity of approaches and techniques used in personalised content recommendation systems, ranging from collaborative filtering and content-based methods to hybrid models and deep learning algorithms.

System Requirements for Personalised content recommendation system :

This project can run on a machine with the following specification :

Software :

- Operating System : Windows 10
- Python version 3.11.7
- Python Libraries :
 1. Numpy
 2. Pandas

3. Scikit Learn

4. Matplotlib

Hardware :

Intel Core

RAM 4.00 GB

Conclusion :

The personalised content recommendation project, developed using Python libraries, has successfully demonstrated the efficiency of data-driven methodologies in enhancing user experience and satisfaction through tailored recommendations. we have covered Data Acquisition and Preprocessing , Training the dataset , Testing the model and Evaluation. This personalised content recommendation project contributes to creating a more engaging and valuable user experience, fostering loyalty, and driving business growth in the digital landscape.