RECOMMENDER SYSTEM

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Introduction

Recommender systems are algorithms or models designed to provide personalized recommendations to users based on their preferences, behavior, or historical data. These systems are widely used across digital platforms to improve user engagement by suggesting items like products, movies, articles, or services that align with the user’s interests.

Importance:

Recommender systems make online experiences more personal, helping people quickly find relevant products, movies, or articles. This saves time and keeps people engaged, which is why companies use them so widely.

Types of Recommender Systems:

Content-Based Filtering (CBF)
Collaborative Filtering (CF)
Hybrid

Content-Based Filtering:

Content-based filtering recommends items based on the attributes or features of the items themselves and the user's past behavior. The algorithm looks at the properties of items a user has liked in the past and recommends similar items with matching attributes.

Procs:

It can quickly suggest items even for new users with some initial preferences. This approach doesn't require data from other users.

Cons:

It tends to recommend items that are similar to the user's past interests, which can limit how often you're introduced to something totally new or different.

Collaborative Filtering:

Collaborative filtering relies on data from multiple users to make recommendations. It identifies similar users or items and suggests items based on user preferences or behavior patterns within the entire user base.

Procs:

This method can introduce you to a wider variety of recommendations, including things you might not have found based on item features alone.

Cons:

It depends heavily on user data. If you're new or there's not much user data, it's harder to get accurate recommendations (this is the "cold start" problem).

Case Study:

- Recommendation System used in Google photos:
    - Album Suggestions(people and faces)

Goal:

- Automatically create albums featuring specific people or faces.

Using Content-Based Filtering (CBF):

- This method recommends albums based on the attributes of the photos (i.e., features such as images, timestamps, locations, etc.).

Feature Extraction:

- *For each photo, extract key features like:*
  Visual features,
  Metadata(Time, Location).

Similarity Calculation:

- *Calculate the similarity between photos based on these features. If photos contain similar objects or people, they could also be grouped together.*

Album Recommendation:

- *Based on the user's existing albums (if any), recommend new albums with photos that share similar features.*

Using Collaborative Filtering (CF):

- This method recommends albums based on the behavior of similar users (i.e., who liked or grouped similar photos).

Collect User Data:

- *Gather data on* ***which albums users have created*** *and* ***how they interact with albums.***

User Similarity:

- *Find users who have created or interacted with similar albums. This can be done using user-based collaborative filtering, where you look for patterns between users who have similar album preferences.*

Album Suggestion:

- *Recommend albums to a user based on what similar users have created.*

How it works together:

Content-based filtering

helps organize photos into thematic albums (e.g., nature, parties).

Collaborative filtering

helps suggest albums that other users with similar interests or photo collections have created

Thank You