

Interview questions

Q1. Can you explain the difference between user-based and item-based collaborative filtering?

User-based filtering finds other users who have similar interests.

Item-based filtering finds items that are similar to the target item.

How it works:-

This method focuses on finding users who are similar to a target user based on their past behavior.

* Process:

1) Identify users with similar behavior to the target user using similarity metrics.

2) Recommend item that these similar users have engaged with but the target user hasn't.

Advantages:-

user behavior is well known.

* Personalized recommendations.

* Easy to implement with smaller datasets.

Challenges:

* Scalability: Computationally expensive as the number of users grows.

* Cold start: Difficult to recommend for new users with little or no history.

2) Item-based Collaborative Filtering (IDCF)

How it works:-

The method focuses on finding items that are similar to the items a user has already interacted with.

The system recommends items that are frequently associated with the user's preferred items.

process :-

1) Calculate similarity between items based on user's behaviors.

2) Recommend items similar to those the user has already liked or interacted with.

* Advantages:-

* More scalable than user-based filtering for large user bases.

* Work better in situations where user behavior changes over time.

* Challenges:-

* Requires a large number of item interactions to identify patterns.

* Struggles with new items.

not learning at different times.

2) What is collaborative filtering?

Collaborative filtering is a technique used in recommender systems to suggest items to users based on their previous interactions.

Preferences of other users.

also it is user based system

How does collaborative filtering work?

1) Collect user-item interaction Data:-

Gather data user interact with items.

* Explicit Feedback:

Direct input like rating, review or likes.

* Implicit Feedback:

Indirect signals like purchase history, clicks or time spent watching videos.

2) Create user-item matrix

* This matrix represents users on one axis and items on the other.

* Each cell indicates a user's preference for a particular item.

3) Find similar users or items:-

* Use similarity measure to find patterns.

* User-based: To target a user's preference

* Item-based: To identify items that are similar based on user's collective preferences.

* Common Similarity metrics:

* Cosine Similarity: It measures the cosine of the angle b/w two vectors.

* Pearson Correlation: It measures the linear relationship b/w two users' items.

* Jaccard Similarity: Measures the overlap b/w two sets.

4) Make Predictions:-

* User-based Approach:

Predicts what a user will like an item by looking at how similar users have liked it.

* Item-based Approach:-

Recommend items similar to the ones the user has already liked.

3) Generate Recommendations

* Once the system predicts the likely preference, it suggests the most relevant items.