Hybrid and Advanced Techniques Quiz

测验, 6 个问题

1 point

1。

What is the main point of hybrid algorithms?

- To handle cases where a recommender is trying to balance objectives, e.g., to recommend good products for individual users, but also to make sure that each product gets recommended to enough different users to get sold.
- **To take advantage of situations where no single algorithm provides the best recommendations by combining different algorithms together to achieve a better result.**
- To speed up the computation of recommendations which too often are slow using non-hybrid algorithms. Hybrid algorithms also are easier to optimize for parallel execution.

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1 point

2。

A switching hybrid selects only one recommender algorithm for each situation. Which of the following is the best example of a situation where a switching hybrid algorithm would be most useful?

- When we have several algorithms each of which does a great job with the top 4-5 recommendations, but is worse deeper down in the list.

- When we have different algorithms that are better for recommending to users with few ratings vs. to users with many ratings.
- When we have several different algorithms, but don't really like the results from any of them.

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1 point

3。
How does SVD++ create a form of hybrid recommender within a matrix factorization framework?

- SVD++ incorporates a latent feature space representation for observable user- and item-features (e.g., user age, film genre) as a way to hybridize traditional ratings-based matrix factorization collaborative filtering with recommendation based on user properties (demographics) or item properties (content-based).
- SVD++ performs two separate factorizations of the ratings matrix, one biased towards user coherence (which emulates user-user collaborative filtering) and one biased towards item coherence (which emulates item-item collaborative filtering). It then combines the highest singular values from each factorization into a single vector representation that represents a hybrid of the two techniques.
- SVD++ generates recommendations lists from two different dimensionality reduction recommenders (traditional SVD-based matrix factorization and the shortcut gradient descent method) and then merges the results from those lists creating a more robust mixture hybrid recommender.

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1 point

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4.

George Karypis identified a reason that matrix completion techniques fail for top-n recommendation. What is that reason?

1 point

- (●) These techniques depend on the assumption that the data we observe is randomly distributed from all data (e.g., you've rated movies at random from among all movies), and this assumption is almost never true in real recommendation environments
- ( ) Accurate matrix completion techniques generally require between 10 and 20% observed values, but most recommender applications have much less available data. The result is that these techniques are unbiased, but have a very large noise component that hurts our recommendations.
- ( ) We have accurate methods for matrix completion, but they are computationally intractible (their time is exponential in the rank of the matrix), so we can't use them). Instead we use approximation techniques that we know are biased towards filling in values too close to the mean.

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1 point

5.

In an interview with Arindam Banerjee, we learned about multi-dimensional matrix factorization as an approach to hybrid recommendation. All of the following are benefits of such an approach except one. Which of the following **is not** a benefit of hybrid matrix factorization?

- (●) Multidimensional matrix factorization is significantly faster than traditional techniques
- ( ) Multidimensional matrix factorization can lead to meaningful interpretations of the latent vector space used to describe users and items.
- ( )

Multidimensional matrix factorization can use more information and thereby generate better predictions or recommendations.

Multidimensional matrix factorization can reveal relationships among factors such as customer attributes and product attributes (e.g., older customers prefer larger cars).

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1 point

6。
We've discussed the Netflix Competition. Which of the following statements about the competition and the winning solution is most correct?

The winning algorithm involved a complex hybrid algorithm that used statistical/machine learning techniques to mix together a variety of general-purpose and special-purpose algorithms, in the end resulting in a significantly improved prediction performance for the competition data.

The winning algorithm focused on making the best possible top-100 predictions, and thus turned out to be very useful for on-screen recommendation even though it wasn't as useful at predicting "deeper down" in the set of movies.

Because the competition limited algorithms to using only ratings data, the winning algorithm wasn't nearly as good as an ordinary algorithm that also factors in user and item attributes like age, genre, or cast.

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