Apriori Algorithm Quiz

Review Learning Objectives

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1. What is the Apriori algorithm used for in association rule mining? **1 / 1 point**

- (•) To discover frequent itemsets from a transactional dataset.
- ( ) To generate closed itemsets from a transactional dataset.
- ( ) To create maximal itemsets from a transactional dataset.
- ( ) To find association rules with the highest confidence in a transactional dataset.

Correct
Correct! The Apriori algorithm is used to find frequent itemsets in a transactional dataset.

2. What is the key idea behind the Apriori algorithm for frequent itemset mining? **1 / 1 point**

- ( ) Using machine learning techniques to discover itemsets.
- (•) Employing an iterative approach to generate itemsets of increasing size based on the frequency of smaller itemsets.
- ( ) Utilizing deep learning networks to uncover hidden patterns in the dataset.
- ( ) Using statistical methods to calculate the significance of itemsets in the dataset.

Correct
Correct! The Apriori algorithm uses an iterative process to generate frequent itemsets based on the "apriori" property.

3. How does the Apriori algorithm handle the challenge of an exponentially growing number of possible itemsets? **1 / 1 point**

- ( ) By using a brute-force approach to explore all possible itemsets.
- (•) By using pruning techniques to eliminate infrequent itemsets and reduce the search space.
- ( ) By relying on external memory to store all possible itemsets for efficient exploration.
- ( ) By setting a very high support threshold to limit the number of frequent itemsets.

Correct
Correct! The Apriori algorithm uses pruning to focus on frequent itemsets, reducing the number of possibilities.

4. What is the main drawback of the Apriori algorithm in terms of its computational efficiency? **1 / 1 point**

- ( ) It is unable to discover frequent itemsets in large datasets.
- (•) It requires significant computational power to explore the search space of itemsets.
- ( ) It can only handle binary transaction datasets.
- ( ) It produces a large number of redundant frequent itemsets.

Correct
This option is correct! The Apriori algorithm's computational complexity increases exponentially with the number of items.

5. What is the primary advantage of the Apriori algorithm in frequent itemset mining? **1 / 1 point**

- (•) It can efficiently find frequent itemsets in large transactional datasets.
- ( ) It guarantees the discovery of all possible frequent itemsets in the dataset.
- ( ) It can discover maximal itemsets more effectively than other algorithms.
- ( ) It produces closed itemsets more accurately than other frequent itemset mining methods.

Correct
Correct! Despite its drawbacks, the Apriori algorithm is capable of handling large datasets efficiently.

6. What is the main advantage of the FP-Growth algorithm over the Apriori algorithm? **1 / 1 point**

- ( ) FP-Growth can discover more interesting association rules.
- ( ) FP-Growth does not require support and confidence thresholds for rule mining.
- (•) FP-Growth is more computationally efficient, especially on large datasets.
- ( ) FP-Growth produces more concise and non-redundant frequent itemsets.

Correct
Correct! FP-Growth uses a tree-based structure to efficiently mine frequent itemsets, making it faster on large datasets.

7. How does the FP-Growth algorithm address the challenge of an exponentially growing number of possible itemsets? **1 / 1 point**

- ( ) By using an iterative approach to generate itemsets of increasing size based on the frequency of smaller itemsets.
- ( ) By setting a very high support threshold to limit the number of frequent itemsets.
- ( ) By relying on external memory to store all possible itemsets for efficient exploration.
- (•) By using a tree-based data structure and pattern growth to efficiently mine frequent itemsets.

Correct
Correct! FP-Growth constructs a conditional FP-tree to compress the transactional database and expedite the mining process.

8. What is the main advantage of the FP-Growth algorithm's FP-tree data structure? **1 / 1 point**

- ( ) It guarantees the discovery of all possible frequent itemsets in the dataset.
- (•) It efficiently compresses the transactional database for faster itemset mining.
- ( ) It is more memory-efficient compared to the Apriori algorithm.
- ( ) It automatically removes redundant itemsets from the dataset.

Correct
Correct! The FP-tree data structure helps compress the data, making itemset mining faster.

9. In which scenario is the Apriori algorithm more suitable than FP-Growth? **1 / 1 point**

- (•) When the dataset contains a small number of transactions and a large number of items.
- ( ) When the dataset contains a large number of transactions and a small number of items.
- ( ) When the dataset contains binary transaction data with a single item per transaction.
- ( ) When the dataset contains missing values that need to be handled during itemset mining.

Correct
Correct! Apriori's iterative approach can be more efficient in such cases.

10. In which scenario is the FP-Growth algorithm more suitable than Apriori? **1 / 1 point**

- ( ) When the dataset contains a small number of transactions and a large number of items.
- (•) When the dataset contains a large number of transactions and a small number of items.
- ( ) When the dataset contains binary transaction data with a single item per transaction.
- ( ) When the dataset contains missing values that need to be handled during itemset mining.

Correct
Correct! FP-Growth is designed to handle such datasets efficiently.

11. Which algorithm is more likely to perform better on a transactional dataset with a high number of items and low support threshold? **1 / 1 point**

- ( ) Apriori algorithm.
- (•) FP-Growth algorithm.
- ( ) Both algorithms will perform equally well under these conditions.
- ( ) The performance depends on the size of the transactional dataset.

Correct
Correct! FP-Growth's tree-based approach can handle large datasets with low support efficiently.

12. Which of the following statements is true regarding the scalability of Apriori and FP-Growth? **1 / 1 point**

- ( ) Apriori is more scalable to large datasets than FP-Growth.
- (•) FP-Growth is more scalable to large datasets than Apriori.
- ( ) Both algorithms have similar scalability to large datasets.
- ( ) The scalability depends on the specific hardware used for itemset mining.

Correct
Correct! FP-Growth's FP-tree structure improves its scalability.