THADOMAL SHAHANI TSEC ENGINEERING COLLEGE

DWM 12.1

-: Assignments :- (02)

Q1 Write short notes on

a) Multilevel Association rules and Multidimensional association rules
b) Web Usage Mining.

⇒ a) i) Multilevel Association Rule:

Defn: It is a type of DM technique that extends traditional association rule mining by considering multiple levels of abstraction within the data.

Hierarchy: In multilevel association rule mining data is organized in a hierarchical structure. This hierarchy can be based on attrib., categ., or any other form of hierarchy present in the data.

Ex:- Consider a retail dataset. Multilevel association rules can be applied to find associations and patterns not only at the level of individual products but also at higher levels, such as product categ. departments or even across the entire store.

UseCase: Multilevel association rules are useful in various domains like retail, where you want to uncover associations.

and patterns across different level of product hierarchy to make informed decisions about product placement, promotion and inventory management.

Multidimensional Association Rules:-

Defn: Multidimensional association rule focus on analyzing data with multiple dimensions or attributes. These rules are often associated with data cubes where each dimension represents a diff. attribute or characteristic.

Data Cubes: In Multidimensional association rule mining data is typically organized in a multidimensional cube, allowing for the analysis of relationship between various dimensions.

Eg: Consider analysis sales data with multiple dimension like product, time, loc., & customer segment. Multidimensional association rules can reveal interesting insights about how these dimensions are correlated.

Use cases: MDs find applications in areas such as business intelligence, where organization want to gain a deeper understanding of their data by exploring.

relationship betn diff. attri. and dimensions. This help in decision making, trend analysis and resources allocation.

In Summary, both multilevel & multidimensional association rule mining techniques are valuable in extracting meaningful patterns and relationship from complex datasets but they focus on different aspects of data hierarchy and dimensionality.

⇒ **Web usage Mining.**

Def": Web usage Mining is a subset of data mining that involves the discovery and analysis of valuable patterns and knowledge from web data, particularly the interactions and behaviors of users on websites.

Types:

- Clickstream Analysis: Examines user clicks, navigation paths and interactions with web pages.
- Pageview Analysis: Shows which web pages are most frequently accessed by users.

Session Analysis: Studies which web pages are most frequently accessed by users.

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⇒ Applications:

→ Personalization: Web Usage Mining is crucial for creating personalized user experiences by offering tailored content product recommendations or advertisements based on a user's past behaviour.

→ Content Improvement: It helps website owners optimize content and layout by identifying which pages are popular which are frequently visited and how users navigate the sites.

→ Marketing Optimization: Marketers use web usage data to target specific user segments with relevant advertising and promotional campaigns.

⇒ Challenges:

→ Privacy Concerns: The collection of user data raises privacy issues and organizations must adhere to regulations like GDPR to protect user information.

→ Data Volume: Websites generate massive amounts of data meaning efficient data storage retrieval and processing.

Methods:

Data Missing: web data can be noisy and incomplete due to factors like bot traffic incomplete user sessions and server errors.

Web usage Mining is a valuable tool for web-based businesses and organizations looking to enhance user experience increase engagement and make data-driven decisions to improve their online presence.

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