**Course: Advanced Bioinformatics**

**Module title: Associate Rules**

**Module no. : 183**

Association rule learning is a popular and well researched method for discovering interesting relations between variables in large databases. It is intended to identify strong rules discovered in databases using different measures of interestingness. Based on the concept of strong rules, Rakesh Agrawal et al. introduced association rules for discovering regularities between products in large-scale transaction data recorded by point-of-sale (POS) systems in supermarkets. For example, the rule \{\mathrm{onions, potatoes}\} \Rightarrow \{\mathrm{burger}\} found in the sales data of a supermarket would indicate that if a customer buys onions and potatoes together, they are likely to also buy hamburger meat. Such information can be used as the basis for decisions about marketing activities such as, e.g., promotional pricing or product placements. In addition to the above example from market basket analysis association rules are employed today in many application areas including Web usage mining, intrusion detection, Continuous production, and bioinformatics. In contrast with sequence mining, association rule learning typically does not consider the order of items either within a transaction or across transactions.

* It is an important data mining model studied extensively by the database and data mining community
* Assume all data are categorical
* No good algorithm for numeric data

**Parts:**

An association rule has two parts

* an antecedent (if)
* a consequent (then)

Antecedent is an item found in the data

A consequent is an item that is found in combination with the antecedent

Association Rule Basket Analysis Example:

**Market basket transactions:**

t1: {bread, cheese, milk}

t2: {apple, eggs, salt, yogurt}

… …

tn: {biscuit, eggs, milk}

Concepts: An item: an item/article in a basket

I: The set of all items sold in the store

A transaction: Items purchased in a basket;

it may have TID (transaction ID)

A transactional dataset: A set of transactions