

(ii) Association Rule Mining

'ARM' also called as Market Basket Analysis (MBA) and Affinity Analysis.

- Set of items in a transaction is called Market Basket.
- Mostly used in RETAIL.
- If A then 'B' $\{A \Rightarrow B\}$
 - ↓
Product
 - ↓
antecedent
 - ↓
Consequent

~~Example~~

Support: (s) Percentage (%) of transactions (T) that contains both 'A' and 'B'.

$$("A" \Rightarrow "B") = P(A \cap B)$$

- measures frequency of association

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Confidence (c) - In a transaction set ~~T~~ 'T' if 'c' is the % of times 'B' is present in all the transactions containing 'A'.

$$c = P(B/A) = \frac{P(A \cap B)}{P(A)}$$

• strength of association.

Parameters

- (i) Finding all items that appears frequently in transaction. { min. support count.
- (ii) Finding strong associations among frequent items. { confidence.

Association Rule

- Analyzes and predicts customer behaviour.
 - If/then statements.
- Example.

Bread \Rightarrow butter

buys {onions, potatoes} \Rightarrow buys {tomatoes}

Parts of Association Rule

Bread \Rightarrow butter [20%, 45%]

Bread : Antecedent

Butter : consequent

20% \rightarrow Support

45% \rightarrow confidence

Support & confidence

$A \Rightarrow B$

- Support denotes probability

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that contains both A & B.

- Confidence denotes probability that a transaction containing A also contains B.

Example

- Consider, in a super Market

Total transaction : 100

Bread : 20

So, $\frac{20}{100} * 100 = 20\%$ which is support.

In 20 transaction, butter : 9 transactions. So, $9/20 * 100 = 45\%$ which is confidence