## Market Basket Analysis in Retail: Mining Association Rules to Understand Consumer Behaviour

1. **Introduction:**

Market Basket Analysis (MBA), also referred to as association rule learning or affinity analysis, is a data mining approach commonly applied in fields such as education, nuclear science, bioinformatics, and marketing. This technique involves examining customer purchasing patterns to provide insights that help retailers make more informed business decisions (Kaur and Kang, 2016)**.** It is challenging for organizations to maintain a strong position in competitive markets, as this depends heavily on their decision-making abilities and understanding of customer behaviour (Raorane, Kulkarni and Jitkar, 2012). For this reason, studying customers' buying habits is vital for any organization's success (Gupta and Mamtora, 2014).

1. **Background:**
2. **Literature Review:**

**3.1 Machine Learning Algorithms:**

**3.2 Apriori Algorithm:**

According to (Gupta and Mamtora, 2014). The intuition behind the apriori algorithm is described by,

* Only a large item set can be an item set if all its subsets are large item sets.
* It is possible to accept collections of products that have minimal support.
* From frequent item sets, association rules can be created.

**3.4 Collaborative Filtering Algorithm for Product Recommendation:**

**3.5 Principal Component Analysis:**

Principal Component Analysis (PCA) is a well-known method in statistical multivariate data analysis, and it has been applied widely. It is mainly utilized to reduce the dimensionality of the dataset (Levin, Ken and Moody, 1994). The PCA was employed to project the data onto a transformed space that is invariant to certain linear transformations, to better measure the similarity or dissimilarity of two points. It has been implemented for information retrieval and is called latent sematic indexing (Aggarwal, 2001).

* 1. Research Question:

RQ1) How effective is Principal Component Analysis in performing Market Basket Analysis?

RQ2) What major challenges do retailers face when implementing Association rule mining techniques?

* 1. Search String
  2. Inclusion/Exclusion criteria:

1. Bibliography

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