# **Market Basket Insights:**

**NAME: PRASKASH.R**

**NM ID : au513521106026**

**COLLEGE: AMCET**

**PROBLEM DEFINITION:**

The problem is to perform market basket analysis on a provided dataset to unveil hidden patterns and associations between products. The goal is to understand customer purchasing behaviour and identify potential cross-selling opportunities for a retail business. This project involves using association analysis techniques, such as A priori algorithm, to find frequently co-occurring products and generate insights for business optimization.

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## **DESIGN THINKING :**

The design thinking for this project includes **six steps** , they are

1. Data source
2. Data Pre Processing
3. Association Analysis
4. Insights Generation
5. Visualization
6. Business Recommendation

Let us see about the each phase in detail.

### **1.DATA SOURCE:**

In this step **the required dataset** for the fake news detection is collected .For this process the classical dataset for fake detection from the Kaggle is taken . This dataset consists of the true news and the fake news and so by using this dataset it will be effective for the training of the ML model.

The link for the dataset we will be using for this project is :[**https://www.kaggle.com/datasets/clmentbisaillon/fake-and-real-news-dataset**](https://www.kaggle.com/datasets/clmentbisaillon/fake-and-real-news-dataset)

### **2.DATA PREPROCESSING :**

The foundation of market basket analysis begins with data preprocessing. In this module, raw transaction data is cleaned, transformed, and organized into a format suitable for analysis. Missing values are handled, and outliers are identified and managed appropriately.

### **3.ASSOCATION ANALYSIS:**

Association rule mining is at the core of market basket analysis. This module employs algorithms such as A priori or FP-Growth to discover frequent item sets and extract meaningful association rules. These rules reveal which products are often purchased together, enabling targeted marketing and cross-selling strategies

### **4. INSIGHT GENERATION:**

we will generate rules using the A priori algorithm. The function a priori() is from package a rules. The algorithm employs level-wise search for frequent item sets. Algorithm will generate frequent item sets and association rules.

**5.VISULAIZATION:**

We have thousands of rules generated based on data, we will need a couple of ways to present our findings. We will use Item Frequency Plot to visualize association rules.

### **6.BUSINESS RECOMMENDATION:**

To use market basket analysis, all we need is impersonal transaction data, such as a transaction ID and which products were purchased. The algorithm analysis the sum of all past transactions to determine which products are frequently purchased together, allowing us to make real-time, un personalized recommendations.

# **RESULTS :**

The results of the model will be evaluated by given the **various input data based on different criteria .** If the accuracy rate is less then the input and output are **again used as the training data** to the model .

# **FURTHER PROJECT IMPLEMENTATIONS:**

Using the above six steps in the design thinking the project will be developed with the **Agile methodology** and the errors and issues in each phase will be cleared at the respective phases itself .

With help of the help of the Version Control Systems like **Git hub** the project will be tracked and the final project will be developed successfully .

# **TOOLS / MODULES USED:**

The tools and some of the modules uses in this project are

1. **Python** language
2. **Numpy , pandas , scikit-learn , matplotlib** modules