TITLE: MARKET BASKET ANALYSIS

Project definition: computing the trend in the dataset by analyzing the patterns

Problem Statement:

The problem at hand is to analyse customer transaction data and discover product associations, enabling us to make informed decisions about product placements, bundling, and marketing strategies. This analysis will provide actionable insights for the retail business to increase revenue and customer satisfaction.

DESIGN APPROACH:

Objectives:

- Identify frequently co-purchased products.
- Optimize inventory management based on association rules.
- Enhance product recommendations for customers.
- Understand and segment customer purchasing behavior.

Scope:

In Scope:

- Data collection and preprocessing.
- Association analysis using the Apriori algorithm.
- Insights generation and visualization.
- Business recommendations based on analysis.

Out of Scope:

- Real-time analysis (this is an offline analysis).
- Implementation of recommendation systems in an e-commerce platform.

Data Source and Collection:

Data Source: The dataset will be provided by the retail business, containing transaction records, including product lists, transaction IDs, and purchase dates.

Data Collection: Data will be obtained directly from the provided dataset, which is representative of the retail business's transactions.

Data Preprocessing:

- Data cleaning will involve handling missing values and duplicates.
- Data transformation will convert the data into a transaction format with sets of purchased items.
- Irrelevant information, if any, will be removed.

Methodology:

Approach: Utilize the **Apriori algorithm for association analysis.**

Tools and Technologies: Python, Pandas, Scikit-learn, and MLxtend library for Apriori implementation.

Analysis and Model Building:

Data analysis will involve exploring transaction patterns, such as frequently co-purchased items.

No specific model building is required for this analysis.

Results and Interpretation:

Results will be presented through visualizations, including association rules, scatter plots, and heatmaps.

Key performance metrics for the analysis include **support, confidence, and lift.**

Visualization:

Visualization tools such as Matplotlib and Seaborn will be used to create visual representations of the discovered associations.

Recommendations:

Provide actionable recommendations, including bundling related products together.

Suggest optimizing inventory based on product associations.

Segment customers for targeted marketing strategies.

Quantify the potential impact of recommendations on sales.

Project Timeline:

A detailed project timeline will be created to outline milestones, tasks, and deadlines. This will ensure the project stays on track and is completed within the specified timeframe

Conclusion:

This project design document outlines our approach to performing Market Basket Analysis for retail optimization. It provides a clear roadmap for addressing the problem and delivering actionable insights to the retail business.