MARKET BASKET ANALYSIS

The purpose of this overall Market Basket Analysis project is to analyze customer purchasing behavior by identifying patterns and associations between products frequently bought together. This helps retailers to optimize product placement, pricing, and cross-selling strategies, ultimately boosting sales and customer satisfaction.

What We Did:

- Used the Online Retail II dataset with over 1 million transactions.
- Cleaned and preprocessed transactional data (removed missing values, cancellations, negative quantities).
- Converted data into transaction baskets for analysis.
- Applied the Apriori algorithm to mine association rules representing product co-purchases.
- Explored and visualized key product associations using support, confidence, and lift metrics.
- Built a recommendation system to suggest products based on a customer's basket.
- Exported results for actionable business insights.

What We Found:

- Identified frequent itemsets and strong association rules, showing which products are commonly bought together.
- Uncovered useful cross-selling opportunities and product bundles.
- Generated recommendations that align with actual customer behavior.
- Insights to optimize store layout, marketing campaigns, and inventory based on purchase affinities.
- Demonstrated how Market Basket Analysis can guide strategic decisions in a UAE-relevant retail context to improve sales and competitive advantage.

This project equips retail decision-makers with data-driven knowledge to enhance customer engagement and revenue through insightful product association analytics.

OVERVIEW:

The overview of this Market Basket Analysis project is:

This project involves analyzing a large dataset of retail transactions (Online Retail II dataset) to discover patterns and associations between products that customers frequently purchase together. The objective is to transform raw customer purchase data into actionable business insights to:

- Identify frequent product combinations and association rules using data mining algorithms, specifically Apriori.
- Understand customer buying behavior to enhance product placement, cross-selling, and promotions.
- Generate product recommendations tailored to individual customer baskets.
- Optimize inventory management and pricing based on discovered purchase patterns.
- Support marketing campaigns with targeted offers using insights from customer purchase affinities.

Ultimately, this project equips retailers—specifically in the context of the UAE and similar markets—with data-driven strategies to improve customer engagement, increase revenue through effective cross-selling, and strengthen competitive advantage.

The analysis steps include data cleaning, transaction formation, mining association rules, visualization, recommendation building, and exporting results for business application.

This project helps retailers maximize profitability and customer satisfaction by enabling smarter decisions based on actual shopping basket data.