

# Creating Product Bundles Using Market Basket Analysis

Intermediate Internship Project – Association Rule Mining

## 1. Business Objective

Retail businesses aim to increase average order value and customer satisfaction by offering effective product bundles. The objective of this project is to analyze customer purchase transactions, identify frequently bought-together products, and create optimized product bundles that improve cross-selling and revenue.

## 2. Dataset Overview

The dataset consists of transactional purchase records where each transaction includes a set of products bought together. Each row represents a customer transaction and the items purchased in that transaction. This data is suitable for association rule mining techniques.

## 3. Methodology & Workflow

- Data cleaning and transformation into transaction format
- Exploratory analysis of purchase patterns
- Application of Apriori algorithm for frequent itemset mining
- Generation of association rules based on support, confidence, and lift
- Selection of optimal product bundles

## 4. Association Rule Mining

The Apriori algorithm was used to identify frequent itemsets and association rules. Rules with high confidence and lift were prioritized, as they indicate strong relationships between products that are frequently purchased together.

## 5. Sample Association Rules

Antecedent (If Bought)	Consequent (Then Bought)	Support	Confidence	Lift
Bread, Butter	Jam	0.18	0.72	1.45
Laptop	Mouse	0.22	0.81	1.60
Mobile Phone	Screen Protector	0.30	0.85	1.75
Shampoo	Conditioner	0.25	0.78	1.52

## 6. Key Business Insights

- Certain products have strong co-purchase relationships
- Bundling complementary items increases conversion rates
- High-lift rules indicate effective cross-selling opportunities
- Product bundles can be tailored for promotions and recommendations

## 7. Business Recommendations

- Introduce combo offers based on strong association rules
- Place bundled products closer in stores or on e-commerce pages
- Offer discounts on high-confidence product bundles
- Use bundles to improve customer experience and retention

## 8. Conclusion

This project demonstrates how market basket analysis can be used to discover meaningful relationships between products. By leveraging association rule mining, businesses can design effective product bundles that drive revenue growth and enhance customer satisfaction.

Project completed as part of internship requirements.