

**Problem 1)** Refer to Lab 1 (Problem 2), you have to incorporate *business intelligence* in your PVFC order processing system by adding a recommendation system.

## Recommendation System

A recommendation system for an order processing system analyzes historical order data, user behavior, and item characteristics to predict and suggest products that a customer is likely to purchase next.

These systems

- (i) Improve customer experience
- (ii) Increase Average Order Value (AOV) by identifying purchasing patterns and offering personalized recommendations.

## Recommendation Techniques

Collaborative Filtering (CF):

Recommends items based on similar user behavior. If user A and B have similar order histories, the system suggests items purchased by B to user A.

Content-Based Filtering:

Suggests items similar to those a user has already purchased or viewed, based on item attributes (e.g., category, brand, or price).

Hybrid Systems:

Combines collaborative and content-based filtering to overcome limitations like the "cold start" problem (new users/items with no history).

## Association Rule Mining

Identifies items frequently bought together, ideal for "frequently bought together" bundles or upselling complementary items.

*Assumption: Sufficient numbers of orders are present in database.*

Functionalities to be added

- (i) Display recommendation messages during Product Selection and Order Placement

"Customers who bought this also bought..."

- (ii) Reordering suggestions for customers
- (iii) For employees/managers of PVFC forecasting demand for secondary items when a primary item's sales increase. (Inventory Management)