



# ESTIMATING STOCK KEEPING UNIT USING ML

## Define Problem Statement

### **Problem Statement:**

Retail and supply chain sectors face significant challenges in maintaining optimal inventory levels. Overstocking leads to increased storage costs and potential product waste, while understocking results in missed sales opportunities and reduced customer satisfaction. Therefore, forecasting demand accurately for stock keeping units (SKUs) is essential for efficient inventory management.

The problem we aim to solve is predicting future demand for individual SKUs using past sales data. Historical sales patterns, price changes, promotional offers, and other temporal data are used to model this demand. Our goal is to create a machine learning system that can analyze past trends and accurately forecast the number of units that will be sold for each SKU in the near future.

**Objectives:**

- Develop a predictive model that forecasts SKU-level sales for future weeks.
- Minimize forecasting errors using advanced regression techniques.
- Create a user-friendly web application that takes recent sales inputs and returns predictions.
- Enable better decision-making in inventory and supply chain management through data-driven insights.

**Scope:**

This project uses real-world sales data that includes pricing, promotional activities, and units sold over time. We focus on feature engineering using lag values, rolling averages, and encoded identifiers to extract patterns. The best-performing model will be deployed as a Flask web application for real-time prediction.

**Expected Impact:**

- Improve inventory planning accuracy
- Reduce costs associated with overstocking or understocking
- Enhance operational efficiency across supply chain operations

This problem addresses a key issue in retail analytics and has broad applications across industries managing physical inventory.