# 1. Supply Chain Analytics:

- **Supplier Performance Analysis**:
  - Assess the reliability of suppliers based on lead time consistency, stock availability, and the impact of any delays on sales.
  - Use metrics like on-time delivery rates, average lead time, and frequency of stock-outs to evaluate suppliers.
- **Inventory Optimization**:
  - Use inventory levels, reorder points, and lead times to determine optimal stock quantities.
  - Consider implementing demand forecasting models to better align inventory levels with sales trends and minimize stockouts or excess stock.
- **Lead Time Analysis**:
  - Analyze historical lead time data to identify bottlenecks and opportunities for reducing delays.
  - Lead time analysis could help in adjusting reorder points or exploring alternative suppliers for quicker restocks.

# 2. Financial Analysis:

- **Profit Margin Analysis**:
  - Analyze how different pricing strategies (e.g., discount percentages) affect profit margins.
  - Use financial metrics like unit cost, original price, and final price to evaluate product profitability.
- **Discount Impact on Sales**:
  - Measure how different discount percentages influence sales volume and overall revenue.
  - Look at the elasticity of demand—how sales change when discount levels change—and find the optimal discount strategy.
- **Revenue Forecasting**:
  - Use historical revenue data, adjusted for seasonal trends and promotional events, to create predictive models for future revenue.
  - Incorporate sales patterns to predict peaks in demand during holidays, summer, or promotional events.

## 3. Advanced Sales Analysis:

- **Seasonal Decomposition**:
  - Apply time series decomposition to identify seasonal components, trends, and residual noise in sales data.
  - Use this analysis to forecast future sales, adjusting for seasonal and cyclic patterns (e.g., summer boost, holiday spikes).
- **Holiday Impact Assessment**:
  - Assess how specific holidays (like Christmas, Thanksgiving, or New Year) influence sales volume.
  - This can guide inventory planning, staffing decisions, and marketing efforts to take advantage of holiday-driven sales.
- **Promotion Effectiveness**:
  - Evaluate the effectiveness of random promotional events on sales performance.
  - Compare sales during promotional periods against regular periods to determine the lift provided by promotions.