BUSINESS INSIGHITS

1. Predictive Pricing Opportunities:

Observation: Revenue fluctuates significantly for the same product depending on region, season, and category demand.
Approach:

- Use regression models to predict optimal pricing for each region and season.
- Train the model using features like Region, Category, Season, and Historical Sales.
  Actionable Insight: Automate **dynamic pricing models** for revenue optimization and maximize profits during peak demand.
  Why It Fits: Predictive pricing demonstrates data science application through feature engineering, modelling, and actionable deployment.

2. Early Customer Churn Prediction:

Observation: First-time transactions within 30 days of signup correlate with repeat purchases and higher lifetime value (LTV).
Approach:

- Train a classification model) to predict churn probability based on features like SignupDate, FirstTransactionDate, and Purchase History.
- Identify at-risk customers and segment them for personalized campaigns.
  Actionable Insight: Use the model to implement **early intervention strategies** like discounts, personalized emails, and loyalty offers.
  Why It Fits: Customer retention is a prime data science use case, showcasing predictive analytics and customer behaviour modelling.

3. Cross-Sell Recommendation System:

Observation: Purchase patterns reveal that accessory sales increase after high-value product purchases.
Approach:

- Build a **collaborative filtering recommendation system** to suggest complementary products.
- Train the system on **CustomerID, ProductID**, and **TransactionID** using techniques like Matrix Factorization or Neural Collaborative Filtering.
  Actionable Insight: Deploy the model in real-time at checkout to suggest relevant bundles or add-ons, boosting Average Order Value (AOV).
  Why It Fits: Building a recommendation system highlights applied machine learning in enhancing customer experience and revenue.

4. Seasonal Demand Forecasting:

Observation: Certain product categories exhibit **30-50% higher demand** during specific months

Approach:

- Use **time series forecasting models** to predict seasonal demand trends.
- Include features like ProductID, Category, Region, and TransactionDate for granularity.
  Actionable Insight: Use forecasts to optimize inventory, logistics, and marketing strategies during peak seasons, minimizing stockouts or excess inventory.
  Why It Fits: Seasonal forecasting is a classic data science problem involving time-series analysis and trend extraction.

5. Cart Abandonment Prediction

Observation: 15% of customers abandon their carts due to factors like pricing, shipping options, or unclear product details.
Approach:

- Train a machine learning model on CustomerID, CartContents, TimeSpent, and CartValue to predict abandonment likelihood.
- Analyze feature importance to identify root causes
  Actionable Insight: Create interventions like **exit-intent popups**, personalized discounts, or shipping upgrades for at-risk customers.
  Why It Fits: Predicting cart abandonment leverages classification algorithms and behavioral analysis, key skills for data scientists.