Product Analysis Research Plan

1. Define Objectives and Scope

- Objective: Identify the best-selling products, understand sales trends over time and across different markets, and provide recommendations to improve sales.

- Scope:

- - Analyze sales data to identify top-selling products.

- - Examine sales trends over time and across different markets.

- - Identify factors contributing to product popularity and sales performance.

2. Data Collection

- Sales Data: Collect data on sales transactions, including product ID, quantity sold, sale price, date of sale, and market/region.

- Product Data: Gather information on product categories, specifications, and pricing.

- Market Data: Obtain data on different markets/regions where products are sold.

3. Data Cleaning and Preprocessing

- Missing Values: Identify and handle missing values.

- Duplicates: Remove duplicate records.

- Outliers: Detect and address outliers in the data.

- Data Types: Ensure data types are correctly assigned.

- Feature Engineering: Create additional features if necessary (e.g., sales per unit, sales growth rate).

4. Exploratory Data Analysis (EDA)

- Sales Overview:

- - Total sales, average sales, and sales distribution.

- - Identify top-selling products overall and by category.

- Trend Analysis:

- - Sales trends over time (monthly, quarterly, yearly).

- - Compare sales trends across different markets/regions.

- Market Analysis:

- - Identify top-performing markets.

- - Analyze market-specific product preferences.

5. Advanced Analysis

- Sales Drivers: Identify factors driving sales (e.g., product features, pricing, promotions).

- Product Lifecycle: Analyze the lifecycle of products to understand their popularity phases.

- Seasonality: Detect seasonal trends and their impact on sales.

- Customer Preferences: Use customer data to correlate product popularity with customer segments.

6. Segmentation and Profiling

- Product Segmentation: Group products based on sales performance, categories, and other relevant features.

- Customer Segmentation: Segment customers based on purchase behavior and preferences.

7. Predictive Modeling

- Sales Forecasting: Build models to predict future sales based on historical data and identified trends.

- Market Basket Analysis: Use association rule mining to identify frequently bought together products.

8. Visualization and Dashboard Creation

- Sales Dashboard: Create interactive dashboards to visualize sales performance, trends, and key metrics.

- Market Dashboard: Develop dashboards to compare sales performance across different markets.

- Product Dashboard: Visualize the performance of individual products and categories.

9. Recommendations

- Product Strategy: Suggest strategies to boost sales of underperforming products.

- Market Expansion: Identify potential markets for expansion based on product performance.

- Promotion Strategy: Recommend promotional strategies to enhance sales.

10. Reporting and Presentation

- Detailed Report: Compile findings, analysis, and recommendations into a comprehensive report.

- Executive Summary: Create a concise summary highlighting key insights and actionable recommendations.

- Presentation: Prepare a presentation for stakeholders to communicate findings and suggestions effectively.

Tools and Technologies

- Data Analysis: Python, Pandas, NumPy, SQL.

- Visualization: Tableau, Power BI, Matplotlib, Seaborn.

- Statistical Analysis: Scikit-learn, Statsmodels.

- Database: SQLite, MySQL, PostgreSQL.