# Case Study on Supermarket Data Analysis using PowerBI

## Objective:

The objective of this project is to contribute to the success of a business by utilizing data analysis techniques, specifically focusing on time series analysis, to provide valuable insights and accurate sales forecasting. This will be achieved through the creation of intuitive and visually appealing dashboards, data analysis to provide insights on sales effectiveness, and leveraging historic data to generate sales forecasts for the next 15 days.

## Description:

### Dashboard Creation:

Creating a dashboard in PowerBI based on the provided data and objectives involves designing visualizations that capture key performance indicators, sales trends, forecasting insights, and actionable recommendations. Here's a breakdown of the dashboard components:

1. **Key Performance Indicators (KPIs):**

   - **Total Sales:** Displayed as a total revenue figure for the selected time period.

   - **Average Daily Sales:** Calculated as the average sales per day over the selected time frame.

   - **Customer Segmentation:** Visualize sales distribution by customer segments (e.g., new customers, returning customers, high-value customers) using a pie or bar chart.

2. **Sales Trends:**

   - **Time Series Plot:** Show sales trends over time (e.g., daily, weekly, monthly) using a line chart.

   - **Seasonality Analysis:** Highlight seasonal patterns in sales using a seasonal decomposition chart or heatmap.

   - **Sales by Product Category:** Display sales performance by product category using a bar chart or treemap.

3. **Forecasting Insights:**

   - **Forecasted Sales:** Present the predicted sales for the next 15 days using a line chart overlaying historical sales data.

   - **Confidence Intervals:** Show confidence intervals around the forecasted values to indicate the uncertainty of predictions.

4. **Actionable Recommendations:**

   - **Promotions Analysis:** Visualize the impact of promotions on sales using a comparison chart or heatmap.

- **Inventory Management:** Display inventory levels and highlight any stockouts or excess inventory situations.

- **Customer Behaviour Analysis:** Explore customer purchasing patterns and identify opportunities for cross-selling or upselling.

5. **Interactive Features:**

- **Date Range Selector:** Allow users to select the desired time period for analysis.

- **Drill-Down Functionality:** Enable users to drill down into specific regions, product categories, or customer segments for detailed analysis.

- **Filtering Options:** Provide filtering capabilities to explore data by different dimensions (e.g., region, product, customer type).

6. **Overall Performance Summary:**

- **Summary Cards:** Display key metrics such as total sales, average daily sales, and forecasted sales in summary cards for quick reference.

- **Performance Comparison:** Show year-over-year or month-over-month comparisons to assess performance trends.

## Design Considerations:

- Ensure the dashboard layout is intuitive and easy to navigate.

- Use consistent color schemes and labelling conventions for clarity.

- Optimize visualization types based on the nature of the data and the insights to be conveyed.

- Incorporate tooltips and annotations to provide additional context and explanation.