Toy Company Sales Analysis

Project Objective:

The objective of this project is to create a **Diagnostic Analysis report** in Power BI, building on the insights from the descriptive analysis phase. The goal is to answer key business questions using advanced features such as **Data Analysis Expressions (DAX)**.

This dashboard explains:

- Why sales spike in certain months (e.g., November).
- Why sales dip during summer.
- Why the U.S. contributes the most revenue.
- Why some product lines, like Classic Cars and Vintage Cars, outperform others such as Trains.

Dataset:

- The dataset was collected from the *Dataset* folder under the file: **`sales_data_cleaned`.**
- It contains order-level sales data including columns such as Order Date, Country, Product Line, Deal Size, and Sales.

Methodology:

1. **Data Import & Modeling**
    - Loaded the cleaned dataset into Power BI.
    - Ensured proper data types (e.g., Year, Month as whole numbers).
    - Created calculated columns for time intelligence.
2. **DAX Calculations**
    - Built custom measures for sales performance, seasonality, geographic contribution, and product line analysis.
3. **Dashboard Design**
    - Developed a three-page dashboard, each focusing on one analytical objective.
    - Used interactive visuals with a colorblind-safe theme to ensure accessibility.
4. **Business Insights**
    - Interpreted results to explain the *why* behind sales patterns.

Data Analysis with DAX:

Key Calculated Column

Date Column (to create a date hierarchy for analysis):

```
Date = DATE(sales_data_cleaned[YEAR_ID], sales_data_cleaned[MONTH_ID], 1)
```

Key DAX Measures

- **Total Sales**

```
Total Sales = SUM(sales_data_cleaned[SALES])
```

- **November Sales**

```
November Sales = CALCULATE([Total Sales], sales_data_cleaned[MONTH_ID] = 11)
```

- **Average Monthly Sales**

```
Average Monthly Sales = AVERAGEX(VALUES(sales_data_cleaned[MONTH_ID]), [Total
Sales])
```

- **Summer Sales (June–August)**

```
Summer Sales = CALCULATE([Total Sales], sales_data_cleaned[MONTH_ID] IN {6,
7, 8})
```

- **Total U.S. Revenue**

```
Total US Revenue = CALCULATE([Total Sales], sales_data_cleaned[COUNTRY] =
"USA")
```

- **% Contribution of U.S. Sales**

```
% Contribution of US = DIVIDE([Total US Revenue], [Total Sales], 0)
```

- **Average Order Value**

```
Average Order Value = AVERAGEX(sales_data_cleaned, sales_data_cleaned[SALES])
```

Dashboard Design & Visualization:

Page 1: Sales Trends (Seasonality)

- **Line Chart:** Monthly sales trend highlighting November spike and summer dip.
- **KPI Cards:** November Sales, Average Monthly Sales, Summer Sales.
- **Clustered Column Chart:** Breakdown of sales by product line during November and summer.

Page 2: Geographic Analysis

- **Map Chart:** Sales distribution by country.
- **Bar Chart:** Top 5 countries ranked by sales.
- **KPI Cards:** U.S. revenue, U.S. contribution to global sales, U.S. average order value.

Page 3: Product Line Performance

- **Bar Chart:** Revenue by product line.
- **Donut Chart:** Product line contribution to total revenue.
- **Matrix Table:** Regional breakdown of sales by product line.

Design Choices:

- **Custom Colorblind-Safe Theme**: Implemented JSON theme using Okabe–Ito and Paul Tol color palettes.
- **Backgrounds & Containers**: Used soft, muted backgrounds (#DFE9F4, #F6F6F7) and subtle borders for visuals.
- **Text Colors**: High-contrast text for readability (#215489 for titles, #133860 for KPIs).
- **Interactivity**: Cross-filtering enabled (e.g., product line selection updates monthly trends).
- **Formatting**: Custom number formatting to prevent rounding issues.

Dashboard snapshots are provided in **Dashboard_Page-1.png, Dashboard_Page-2.png, and Dashboard_Page-3.png**.

Business Insights:

1. Why did sales spike in November?

- **Large Deal Volumes**: November shows the highest share of Large and Medium deals.
- **Product Line Boost**: Classic Cars and Vintage Cars peak in this month, driving the spike.

2. Why do sales dip during summer?

- **Seasonal Slowdown**: Across June–August, sales drop in all deal sizes.
- **Weaker Performance in Key Lines**: Classic Cars and Vintage Cars show reduced demand, pulling down overall sales.

3. Why does the U.S. contribute the most revenue?

- **Higher Order Value**: U.S. average sales per deal are above the global average.
- **More High-Value Deals**: A larger share of Medium and Large deals originate from the U.S.
- **Strong Product Demand**: Classic Cars and Vintage Cars dominate U.S. sales.

4. Why do Classic Cars and Vintage Cars outperform Trains?

- **Higher Revenue per Deal**: Transactions for Classic and Vintage Cars bring significantly more revenue than Train products.
- **Revenue Contribution**: Both categories contribute the largest share of total company revenue, making them the core drivers of business growth.

Conclusion:

- Sales are **seasonal**, with a sharp November peak and summer slowdown.
- The **U.S. market dominates** due to higher-value transactions and strong demand for premium product lines.
- **Classic Cars and Vintage Cars** outperform other product lines because of higher per-order revenue.
- Business strategies should focus on:
    - Leveraging holiday promotions in November.
    - Addressing summer slowdowns with targeted campaigns.
    - Expanding U.S. market strategies.
    - Strengthening premium product offerings.