**Project Procedure – Pharmaceutical Sales Analysis**

**1. Project Planning & Objective Definition**

* Defined the **business problem**: The pharmaceutical company needed insights into sales performance across products, distributors, customers, channels, and sales teams to identify growth opportunities and optimize operations.
* Key objectives:
  + Identify top-performing products, cities, and channels.
  + Analyze distributor and customer contributions.
  + Evaluate sales team performance.
  + Create an interactive Tableau dashboard for decision-makers.

**2. Data Acquisition**

* Received the **raw dataset** (pharmaceutical sales transaction data) from a provided source.
* Confirmed the dataset contained fields such as:
  + Order Date, City, Country, Product Class, Product Name, Distributor Name, Customer Name, Sales Team, Channel, Sales, Quantity, etc.
* Verified file formats and ensured compatibility with R for cleaning and Tableau for visualization.

**3. Data Cleaning & Preparation (R Programming in Kaggle Notebook)**

Performed step-by-step data preparation in **R** using the tidyverse package family.

**Steps carried out:**

1. **Loaded libraries** – tidyverse, lubridate, stringr, etc.
2. **Imported raw CSV file** into R.
3. **Checked data structure** (str(), glimpse()), column names, and initial row count.
4. **Renamed columns** for consistency and readability.
5. **Checked and handled missing values**:
   * For categorical fields like City or Product Class, replaced NAs with "Unknown".
   * For numerical fields like Sales, removed or imputed where necessary.
6. **Corrected data types**:
   * Converted Order Date to Date type.
   * Ensured Sales and Quantity were numeric.
7. **Created new columns**:
   * Extracted Year, Month from Order Date.
   * Created Month-Year for time series analysis.
8. **Removed duplicates** based on unique order identifiers.
9. **Filtered irrelevant data** (e.g., testing/demo records).
10. **Verified data integrity** after cleaning with summary statistics.

**4. Exporting Cleaned Data**

* Saved the cleaned dataset as **pharma\_sales\_clean.csv**.
* Ensured correct encoding and delimiter for Tableau compatibility.
* Downloaded CSV from Kaggle Notebook to local system.

**5. Tableau Data Import & Setup**

* Opened Tableau Desktop and connected to the cleaned CSV.
* Verified all data types:
  + Dates → Date type
  + Sales & Quantity → Number (decimal or whole)
  + Text fields → String
* Created relationships between tables (if multiple datasets were used).
* Standardized geographic fields for mapping (Country, City).

**6. Building the Dashboards in Tableau**

**Page 1 – Executive Summary**

1. **KPIs**:
   * Total Sales
   * Total Orders
   * Top Product Class (sales value)
   * Top Product (sales value)
   * Top City (sales value)
2. **Charts**:
   * Sales by Year (bar chart)
   * Sales by Month (line chart)
   * Sales by Year and Channel (clustered bar)
   * Sales by Sub-channel (donut chart)
   * Sales by Country (map with sales bubbles)

**Page 2 – Distributor & Customer Analysis**

1. **KPIs**:
   * Top Distributor
   * Top Customer
2. **Visuals**:
   * Top 10 Distributors by Revenue
   * Top 10 Customers by Revenue
   * Sales by Distributor & Product (highlight table with conditional formatting)
   * Sales by Channel (donut chart)
   * Sales by Top Cities (map)

**Page 3 – Sales Team Performance**

1. **KPIs**:
   * Top Sales Team
   * Top Sales Manager
2. **Visuals**:
   * Sales by Sales Team & Product Class (bar chart with labels on bars)
   * Sales by Sales Manager (horizontal bar chart)
   * Sales Trend by Sales Team (line chart)
   * Comparison of Sales by Region (map)

**7. Dashboard Design & Formatting**

* Applied **consistent color palette** across all dashboards.
* Added **navigation buttons** for smooth movement between pages.
* Used **reference lines and layout containers** for alignment of KPI cards and charts.
* Applied number formatting:
  + Sales values → Billions (B) with 2 decimal places.
  + Orders → Whole numbers.
* Added tooltips with dynamic labels and key insights.

**8. Testing & Interactivity**

* Added filters for Year, Product Class, and Channel to allow drill-down analysis.
* Tested filter actions to ensure they worked across multiple sheets on the same dashboard.
* Validated that all KPIs updated correctly when filters were applied.

**9. Export & Publishing**

* Exported dashboard as:
  + Tableau Packaged Workbook (.twbx) for offline sharing.
  + Published to Tableau Public for online access.
* Added screenshots of each page for documentation and portfolio presentation.

**10. Final Review & Insights**

* Reviewed dashboard with a focus on **business impact**:
  + Identified top revenue contributors.
  + Highlighted underperforming sales teams.
  + Revealed the geographic concentration of sales.
* Documented findings for the README and LinkedIn project post.