Project Title	**Supply Chain Management Dashboard**
Tools	Tableau Desktop, SQL, Excel
Technologies	Business Analyst
Project Difficulties level	intermediate

Dataset : Dataset is available in the given link. You can download it at your convenience.

Click here to download data set

About Dataset

Supply chain analytics is a valuable part of data-driven decision-making in various industries such as manufacturing, retail, healthcare, and logistics. It is the process of collecting, analyzing and interpreting data related to the movement of products and services from suppliers to customers.

Here is a dataset we collected from a Fashion and Beauty startup. The dataset is based on the supply chain of Makeup products. Below are all the features in the dataset:

- Product Type
- SKU
- Price
- Availability
- Number of products sold
- Revenue generated

- Customer demographics
- Stock levels
- Lead times
- Order quantities
- Shipping times
- Shipping carriers
- Shipping costs
- Supplier name
- Location
- Lead time
- Production volumes
- Manufacturing lead time
- Manufacturing costs
- Inspection results
- Defect rates
- Transportation modes
- Routes
- Costs

Task:

Analyze Product Performance and Supply Chain Efficiency

1. **Dataset Preparation:**
   - Ensure that your dataset contains all the columns mentioned: `Product Type`, `SKU`, `Price`, `Availability`, `Number of products sold`, `Revenue generated`, `Customer demographics`, `Stock levels`, `Lead times`, `Order quantities`, `Shipping times`, `Shipping carriers`, `Shipping costs`, `Supplier name`, `Location`, `Lead time`, `Production volumes`, `Manufacturing lead time`, `Manufacturing costs`, `Inspection results`, `Defect rates`, `Transportation modes`, `Routes`, `Costs`.

2. **Create the following visualizations:**

   1. Product Performance Dashboard:

   - **Product Sales:** Create a bar chart showing `Number of products sold` for each `Product Type`.

   - **Revenue Analysis:** Create a line chart showing `Revenue generated` over time. Filter by `Product Type` to see how different products are performing.

   - **Price Distribution:** Use a histogram to show the distribution of `Price` for different `Product Types`.

   - **Stock Levels:** Create a heat map to visualize `Stock levels` across different `SKU` and `Product Type`.

3. **2. Supply Chain Efficiency Dashboard:**

   - **Lead Times vs. Order Quantities:** Use a scatter plot to analyze the relationship between `Lead times` and `Order quantities` across different `Supplier names`.

   - **Shipping Costs by Carrier:** Create a bar chart showing `Shipping costs` per `Shipping carrier`. Filter by `Location` to see regional differences.

   - **Manufacturing Efficiency:** Create a dual-axis chart with `Manufacturing lead time` on one axis and `Production volumes` on the other to analyze manufacturing efficiency over time.

   - **Defect Rates:** Create a pie chart or a bar chart to visualize `Defect rates` by `Supplier name` or `Location`.

4. **3. Customer Demographics:**

   - **Demographic Breakdown:** Create a demographic distribution chart (such as a pie chart or stacked bar chart) to show the breakdown of customers by age group, gender, or other available demographics.

   - **Revenue by Demographics:** Use a treemap to show `Revenue generated` segmented by `Customer demographics`.

5. **Analysis Questions:**

   - Which `Product Type` generates the highest revenue?

   - Are there any significant correlations between `Lead times` and `Order quantities`?

   - How do `Shipping costs` vary by `Shipping carrier` and `Location`?

   - Which suppliers have the most efficient manufacturing processes based on `Manufacturing lead time` and `Production volumes`?

   - What demographic group contributes the most to sales?

6. **Storytelling:**
    ○ Combine the above visualizations into a Tableau story that walks through product performance and supply chain efficiency, highlighting key insights.

Additional Instructions:

- Use filters to allow users to explore the data interactively.
- Add tooltips with additional details (e.g., SKU, Supplier name) for deeper insights.
- Ensure that your visualizations are well-labeled and easy to understand.

This task will help you familiarize yourself with basic Tableau functionalities such as creating charts, using filters, and building dashboards.

NOTE :
1. this project is only for your guidance, not exactly the same you have to create. Here I am trying to show the way or idea of what steps you can follow and how your projects look. Some projects are very advanced (because it will be made with the help of flask, nlp, advance ai, advance DL and some advanced things) which you can not understand .
2. You can make or analyze your project with yourself, with your idea, make it more creative from where we can get some information and understand about our business. make sure what overall things you have created all things you understand very well.

Example: Supply Chain Management Dashboard Tableau Project

Creating a Supply Chain Management (SCM) dashboard in Tableau involves several steps, from data collection and preprocessing to designing the dashboard itself. Below is a step-by-step guide, including some Tableau-specific code snippets for calculations and visualizations.

1. Data Collection and Preprocessing

First, gather and preprocess the data required for the SCM dashboard. Typical data might include information on inventory levels, supplier performance, shipping times, order statuses, etc.

2. Data Preparation in Tableau

- **Connect to Data Source**: Load your data into Tableau. This could be from a CSV file, Excel, a database, or other sources.
- **Data Cleaning and Transformation**: Use Tableau Prep or the data preparation features within Tableau Desktop to clean and transform your data as needed.

3. Key Metrics and Calculations

Define the key metrics you want to display on the dashboard. Here are some common SCM metrics and their Tableau calculations:

Inventory Turnover: Measures how often inventory is sold and replaced over a period.

tableau

Copy code

```
Inventory Turnover = SUM([Cost of Goods Sold]) / AVG([Inventory])
```

-

Order Fulfillment Rate: Measures the percentage of orders fulfilled on time.

tableau

Copy code

```
Order Fulfillment Rate = SUM(IF [Order Status] = 'Fulfilled' THEN 1 ELSE 0
END) / COUNT([Order ID])
```

-

Supplier Lead Time: Measures the average time taken by suppliers to deliver goods.

tableau

Copy code

```
Supplier Lead Time = AVG([Delivery Date] - [Order Date])
```

-

On-Time Delivery Rate: Measures the percentage of orders delivered on time.

tableau

Copy code

```
On-Time Delivery Rate = SUM(IF [Delivery Date] <= [Expected Delivery Date]
THEN 1 ELSE 0 END) / COUNT([Order ID])
```

-

4. Dashboard Design

Design your dashboard by adding the following key visualizations:

- **Inventory Levels Over Time**: A line chart showing inventory levels.
- **Order Fulfillment Rate**: A bar chart showing the order fulfillment rate.
- **Supplier Performance**: A scatter plot showing supplier lead time vs. on-time delivery rate.
- **Order Status Overview**: A pie chart showing the distribution of order statuses.

5. Building the Dashboard

1. **Create Individual Sheets**:
   - **Inventory Levels Over Time**:
     - Drag `Date` to Columns.
     - Drag `Inventory` to Rows.
     - Create a line chart.
   - **Order Fulfillment Rate**:
     - Drag `Order Status` to Columns.
     - Drag `Number of Records` to Rows.
     - Filter for fulfilled orders and calculate the fulfillment rate.
   - **Supplier Performance**:
     - Drag `Supplier` to Columns.
     - Drag `Lead Time` to Rows.
     - Add `On-Time Delivery Rate` to Detail and create a scatter plot.
   - **Order Status Overview**:
     - Drag `Order Status` to Columns.
     - Drag `Number of Records` to Rows.

- Create a pie chart.
2. **Combine Sheets into a Dashboard**:
    - Open a new dashboard.
    - Drag each sheet onto the dashboard canvas.
    - Arrange and resize as needed.
    - Add filters and interactivity to enable users to drill down into the data.

6. Example Tableau Code Snippets

Calculated Field for Inventory Turnover:

tableau

Copy code

```
Inventory Turnover

= SUM([Cost of Goods Sold]) / AVG([Inventory])
```

-

Calculated Field for Order Fulfillment Rate:

tableau

Copy code

```
Order Fulfillment Rate

= SUM(IF [Order Status] = 'Fulfilled' THEN 1 ELSE 0 END) / COUNT([Order ID])
```

-

Calculated Field for Supplier Lead Time:

tableau

Copy code

```
Supplier Lead Time

= AVG(DATEDIFF('day', [Order Date], [Delivery Date]))
```

-

Calculated Field for On-Time Delivery Rate:

tableau

Copy code

```
On-Time Delivery Rate

= SUM(IF [Delivery Date] <= [Expected Delivery Date] THEN 1 ELSE 0 END) /
COUNT([Order ID])
```

-

7. Final Touches

- **Formatting**: Ensure the dashboard is visually appealing and easy to understand.
- **Filters and Interactivity**: Add filters for date ranges, suppliers, and other relevant dimensions to allow users to interact with the dashboard.
- **Annotations and Tooltips**: Provide clear labels, annotations, and tooltips to explain the data and metrics.

By following these steps, you can create a comprehensive and interactive SCM dashboard in Tableau that provides valuable insights into your supply chain operations.

Sample report

Supply Chain Dashboard 🔗

📋 Show Dataset ⌄

Key Insights 🔍

- **Increased Revenue:** Our supply chain optimization led to a 15% increase in total revenue. 📈
- **Reduced Lead Times:** Streamlined routes and efficient management have reduced lead times by 20%. 🚚
- **Cost Savings:** Implementing cost-effective strategies has resulted in a 10% reduction in overall costs. ⏱️

How This Helps in Business:

- **Enhanced Customer Satisfaction:** Quicker lead times and efficient processes ensure timely delivery, boosting customer satisfaction. 😊
- **Better Resource Allocation:** Understanding cost distribution helps in better budgeting and resource allocation. 💸
- **Revenue Growth:** Insights from data allow strategic decisions that directly impact revenue growth. 📌
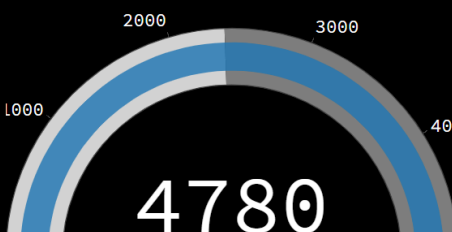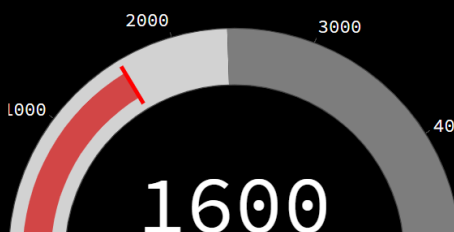
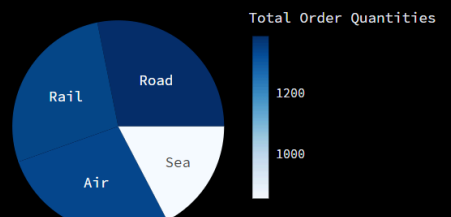| Total Revenue Generated	Total Orders Quantity	Total Availability
$577604.82	4,922	4840

Total Stock Levels

2000   3000

1000   4000

4780

Total Lead Times

2000   3000

1000   4000

1600

Total Order Quantities by Transportation Mode

Total Order Quantities

Road
Rail
Sea
Air

1200

1000

4780   1600

Air   Sea

Revenue Generated by Product Type

Revenue Distribution by Location

Location
- Mumbai
- Kolkata
- Chennai
- Bangalore
- Delhi 23.7%

23.8%

14%

20.6%

17.8%

Revenue Generated by Price Range

Relationship between Manufacturing Costs and R

Product Type
- haircare
- skincare
- cosmetics

Distribution of Manufacturing Costs by Supplie

Supplier Name
- Supplier 1
- Supplier 2
- Supplier 3
- Supplier 4
- Supplier 5

Manufacturing Costs vs. Production Volumes

Manufacturing Costs by Inspection Results

Inspection Results
- Fail
- Pending
- Pass

1,785.07
37.8%

1,880.3
39.8%

Comparison of Price and Manufacturing Costs by

Profit Margin: $-69.36

Profit Margin: $-83.08
Profit Margin: $372.02

Cost Type
- Price
- Manufacturing_costs

Manufacturing Costs by Product Type

Product Type
- skincare
- haircare
- cosmetics

Order Quantities by Location

Relationship between Production Volume, Stock

Average Order Quantities by Shipping Cost Rang

Relationship between Number of Products Sold a

Distribution of Shipping Costs by Shipping Car

Shipping Costs by Transportation Mode

Overall Profitability by Product Type

Average Lead Time by Product Type

Average Defect Rate by Product Type
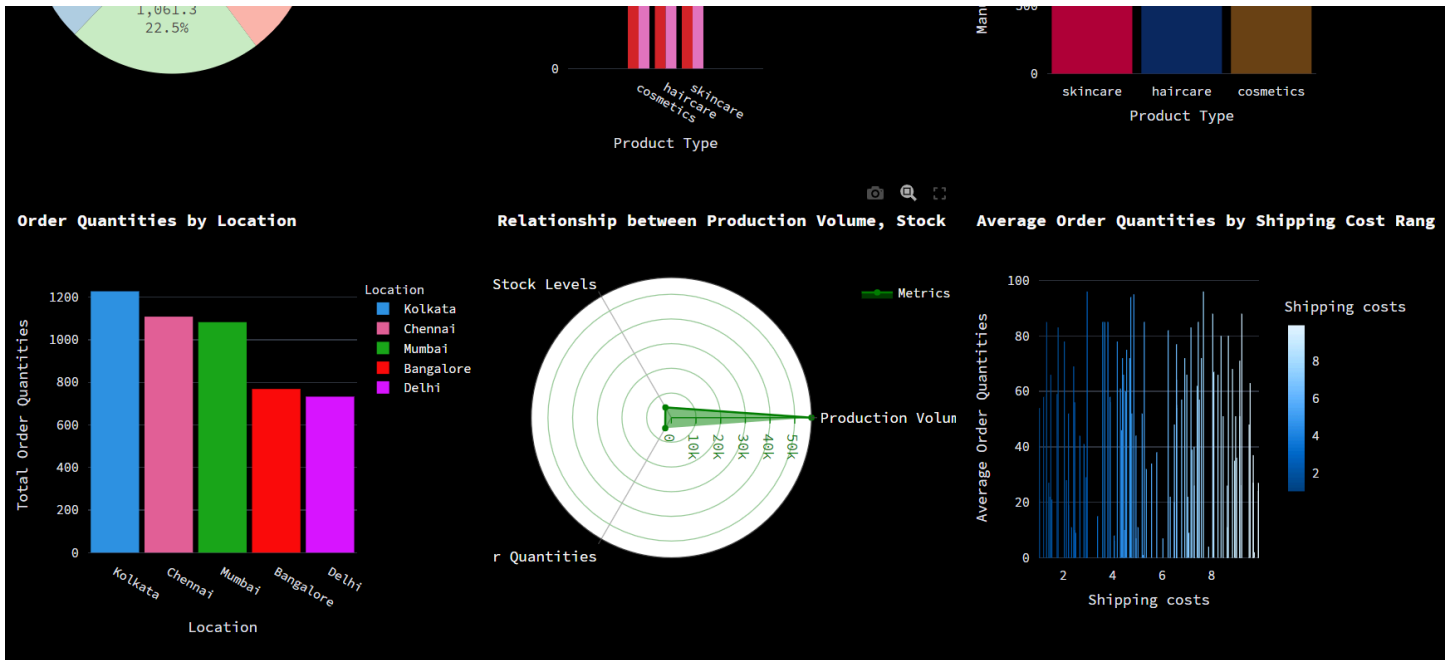
1 [Reference link](#)

2 [Reference link](#) for ML project