Orders and Returns Analysis Report

Objective

The goal of this analysis is to understand the patterns of returned orders in our business. By combining order and return data, we can:
Measure return rates.
Identify trends over time.
Understand factors influencing returns (e.g., shipping mode, return reason).
Provide actionable insights to reduce returns and improve customer satisfaction.

Data Description

Orders Dataset (orders.csv)

Column Name Description

id Unique order identifier
order_date Date of order placement
ship_mode Shipping method used
customer_id Unique identifier for each customer
sales Order value in currency

Returns Dataset (returns.csv)

Column Name Description

order_id Corresponding order identifier
return_id Unique return identifier
return_date Date when the order was returned
return_reason Reason provided for the return

Data Preparation

Orders and returns were merged on id = order_id.

A new column is_returned was created (1 if returned, 0 otherwise).

Date columns were converted to datetime format.

Missing values were handled where necessary.

Key Metrics

Metric Value

Total Orders <total_orders>
Total Returns <total_returns>
Overall Return Rate <return_rate>%

> Note: <total_orders>, <total_returns>, and <return_rate> are dynamically calculated from the filtered dataset.

Analysis and Insights

Return Rate by Shipping Mode

Return rates vary across shipping methods.

Example: If Standard shipping has a higher return rate than Express, this may indicate issues with shipping times or packaging.

Chart: Bar chart showing return rate (%) for each ship_mode.

Monthly Return Trends

Return rates tracked over time can identify seasonal trends or peak periods where returns are high.
Example: Higher returns during holiday months may indicate mismatches between expectations and products.
Chart: Line chart of monthly return rates (%).

Dashboard usage:

Use the interactive dashboard to filter by date and shipping mode to explore specific segments.
Monitor KPIs regularly to detect unusual spikes in returns.

Dashboard Features

Filters: Date range, shipping mode

Key metrics: Total orders, returns, return rate (%)

Visualizations:

Return rate by shipping mode (bar chart)

Monthly return rate (line chart)

Returns by reason (pie chart)

The dashboard is built using Streamlit with Plotly for interactive charts.

Next Steps / Advanced Analysis
Include customer-level metrics: Identify customers with frequent returns.
Include order-level features: Such as average sales, product categories (if available) to predict returns.
Develop a predictive model to flag high-risk orders before shipping