E-COMMERCE SALES DASHBOARD

1. Project Overview

To design and develop an interactive **Power BI dashboard** that visualizes key e-commerce sales metrics and provides actionable business insights. The dataset was **cleaned, preprocessed, and analyzed using Python**.

2. Problem Statement

E-commerce businesses deal with large volumes of sales data from multiple regions, platforms, and product categories. Raw data often contains missing values, duplicates, and inconsistencies. The goal of this project is to:

- Clean and preprocess the raw dataset using Python.
- Build a **dashboard in Power BI** that helps stakeholders monitor performance indicators such as **sales, profit, orders, and customer behavior**.

3. Tools and Technologies Used

Category	**Tools/Technologies**
Programming	Python
Visualization	Microsoft Power BI Desktop
Data Pre processing	Google collab
Data source	E-Commerce sales dataset(csv file)

4. Data Description

Column Name	Description
Invoice No.	Invoice number for each transaction
Stock Code	Product code for each item
Description	Description of the product
Date	Date of each transaction
Time	Time of each transaction
Quantity	Quantity of products purchased in each transaction
Unit Price	Cost of the product per each unit
Customer ID	Customer id for each transaction
Country	Country where each transaction took place

5. Data Pre-processing & Featuring

1. Importing Libraries

```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
```

2. Loading the data

```
df = pd.read_csv('data.csv', encoding='latin-1')
```

3. Data cleaning

- Removed null values using ***df.dropna( )***

```
df = df.dropna()
```

- Dropped the column ***Time*** which is irrelevant in dashboard

```
df=df.drop(['Time'],axis=1)
```

- Converted date columns ***Customer_ID*** to object & ***Date*** to datetime.

```
df = df.astype({
    'CustomerID': 'object',
    'Date': 'datetime64[ns]'
})
```

- Removed negative or invalid entries in column Quantity.

```
df= df[df['Quantity'] > 0]
```

4. Created new column Sales as Quantity * Unit Price

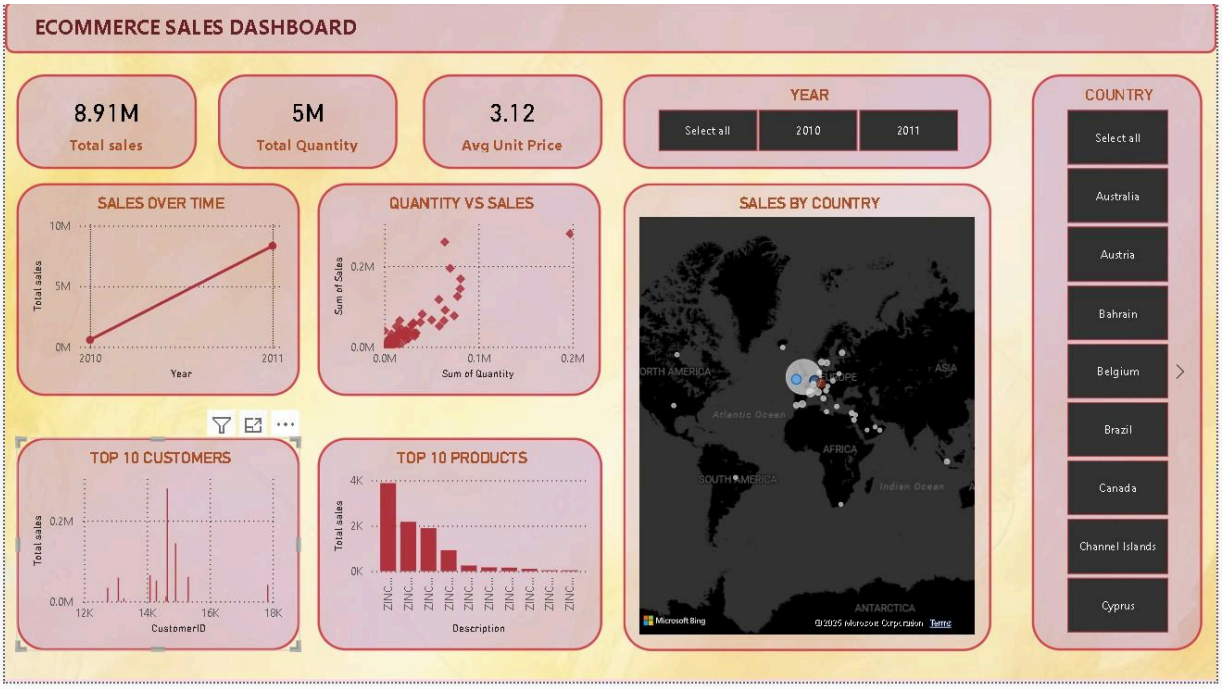
```
df['Sales'] = (df['UnitPrice'] * df['Quantity'])
```

5. Saved the file

```
df.to_csv("clean_data_ecommerce.csv", index=false)
```

6. Power BI Dashboard Design

Column Name	Description
Cards	Shows total sales, total profit, and order count.
Slicers	Shows a selection regarding year and also by countries
Line chart	Shows sales by time
Scatter chart	Shows Quantity with sales
Column chart	Column charts indicating top 10 customers and top 10 products
Map	Shows sales by region



7. Insights and Findings

- **Strong Growth Trajectory:** The significant increase in sales suggests the e-commerce business is in a **rapid growth phase**.
- **Sales Concentration is a Risk:** The business has multiple points of concentration:
    - **Geographically:** High reliance on the primary European market.
    - **By Product:** Heavy dependence on the performance of the top 2-3 products.
    - **By Customer:** Revenue is largely reliant on a few high-spending customers.
- **Potential for High-Value Bulk Orders:** The scattered points on the "Quantity vs Sales" plot suggest that while the average unit price is low ($3.12), the bulk of sales revenue may come from a small number of **large-quantity, high-value orders**.

8. Conclusion

The e-commerce business is currently **successful and rapidly expanding**. However, the performance is **fragile** due to the heavy concentration across multiple factors.

- **Diversification of Revenue:** Focus on **expanding sales into new, high-potential countries** outside the primary European market to mitigate geographic risk.
- **Product Portfolio Strategy:** Investigate and promote the next tier of products (those ranked 4-10) to **reduce dependency** on the top two best-sellers.
- **Customer Retention:** Implement a robust loyalty and retention program specifically for the **top-spending customers** to secure that crucial revenue stream.

Project Submitted By
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