# Sales Analysis — Python Data Science Project

## Project Description

This project is a complete end-to-end sales analysis using Python and the popular Superstore dataset.

It includes data preprocessing, feature engineering, exploratory data analysis (EDA), and visualization to extract meaningful business insights.

## Dataset Description

The dataset used is the Sample Superstore dataset, containing 9,800+ rows with fields such as:

- Order Date
- Ship Mode
- Customer Details
- Product Details (Category, Sub-Category, Product Name)
- Sales, Quantity, Discount, Profit
- Region, State, City

## Key Objectives

- Identify best-performing product categories
- Analyze profit contribution by region
- Discover top-selling products
- Understand monthly and quarterly trends
- Analyze discount impact on profit

## Technologies Used

- Python 3.x
- Pandas, NumPy
- Matplotlib, Seaborn
- Jupyter Notebook / Spyder
- python-docx for Word report generation

## Data Cleaning & Feature Engineering

- Removed duplicate rows
- Converted incorrect data types
- Cleaned numeric fields
- Converted 'Order Date' to datetime
- Extracted Year, Month, Quarter
- Created Profit Margin (%)

## Analysis Performed

- Sales by Category
- Profit by Region
- Monthly Sales Trend
- Top 10 Product Analysis
- Discount vs Profit Visualization
- Correlation Heatmap

## Key Insights

- West region shows highest revenue
- Technology category yields highest profit
- High discounts reduce overall profit
- Sales peak in November and December
- Phones, Binders, and Chairs are top-performing sub-categories

## Project Outputs

- Cleaned dataset (.xlsx)
- Fully commented Python Notebook
- Auto-generated PNG charts
- PDF Report
- GitHub-ready documentation

## Folder Structure

```
superstore-sales-analysis/
│
├── Sales_Analysis.py
├── Superstore.xlsx
├── output/
│   ├── sales_by_category.png
│   ├── profit_by_region.png
│   ├── monthly_sales_trend.png
│   ├── discount_vs_profit.png
│   ├── correlation_heatmap.png
│   ├── Superstore_Sales_Report.pdf
│
├── README.md
└── requirements.txt
```

## Contact

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