📊 Monthly Sales Trends and Analysis

A beginner-friendly **Data Analytics Project** built using **Python, Pandas, and Matplotlib**. This project analyzes sales data over time to identify monthly trends, best and worst performing periods, and regional performance using visual charts.

🕐 Project Objective

The goal of this project is to:

- Calculate **monthly sales totals** from raw data
- Visualize trends using a **line chart**
- Identify the **best and worst months** for sales
- Analyze **regional performance** using a bar chart

This project simulates a real-world sales analytics workflow used by data analysts.

🗂️ Dataset Information

The dataset contains **10,000 rows** of randomly generated sales records.

Columns

Column	Description
Date	Transaction date
Product	Product name
Quantity	Number of items sold
Region	Sales region (North, South, East, West)

File used:

```
random_sales_data_10000_rows.csv
```

🧰 Tools & Technologies

- Python 3
- Pandas
- Matplotlib

• VS Code / Any Code Editor
• macOS Terminal

⚙️ Installation Guide (Mac Beginner Setup)

✂️ Check Python Installation

```
python3 --version
```

✒️ Install Required Libraries

```
python3 -m pip install pandas matplotlib
```

📁 Project Structure

```
sales-analysis-project/
│
├── analysis.py
├── random_sales_data_10000_rows.csv
└── README.md
```

📩 How to Run the Project

Step 1 — Open Terminal

Navigate to the project folder:

```
cd Desktop/sales-analysis-project
```

Step 2 — Run Analysis Script

```
python3 analysis.py
```

📈 What the Script Does

🔗 Monthly Sales Trend

- Converts Date column into datetime format
- Groups data by month
- Calculates total quantity sold
- Displays a **line chart** showing trends

🕐 Best and Worst Months

- Finds highest sales month using `idxmax()`
- Finds lowest sales month using `idxmin()`

📊 Regional Analysis

- Groups data by region
- Shows total sales using a **bar chart**

📖 Output

When the script runs, you will see:

- Monthly sales totals printed in terminal
- Line chart showing sales trends
- Best month and worst month results
- Bar chart comparing regions

Beginner Concepts You Learn

- Reading CSV files with Pandas
- Data grouping and aggregation
- Datetime processing
- Basic data visualization
- Real-world analytics workflow

🛠️ Troubleshooting

🔩 pip command not found (Mac)

Use:

```
python3 -m pip install pandas matplotlib
```

🔩 Charts not showing

- Make sure the script finishes running
- Check if chart windows are behind other apps

🔩 File not found error

Ensure CSV and analysis.py are in the same folder.

🗜️ Possible Future Improvements

- Add revenue column and profit analysis
- Create dashboard-style visualizations
- Add filters by product or region
- Export charts automatically as images
- Build an interactive analytics dashboard

💻 Author

Monthly Sales Analysis Project — Beginner Data Analytics Practice.

🕐 License

This project is free to use for learning and portfolio purposes.