Supermarket ‘s sales README

Supermarket Sales Data Wrangling and Analysis

- **Project Overview**

This project focuses on **data wrangling, exploratory data analysis (EDA), and business insights extraction** from a supermarket sales dataset. The goal is to clean, transform, visualize, and analyze the data to uncover trends and patterns that can support business decision-making.

- **Dataset Information**

- **Source:** Supermarket sales CSV file
- **Columns:** Invoice ID, Branch, City, Customer Type, Gender, Product Line,

Unit Price, Quantity, Tax, Total, Date, Time, Payment Method, Rating

- **Size:** Includes multiple transactions recorded across different cities and branches

Project Workflow

1. **Data Cleaning:**
   - Handle missing values (e.g., fill NaN values in Tax and Total columns)
   - Convert data types (e.g., Date to datetime format, Time to 24-hour format)
   - Remove duplicates and fix inconsistencies
2. **Exploratory Data Analysis (EDA):**
   - Univariate and bivariate analysis
   - Scatter plots, bar charts, and distribution plots

3. **Business Insights Extraction:**
    - Best-selling product lines
    - Customer purchasing behavior (gender, payment methods)

Key Visualizations

- **Sales Trend Over Time**
- **Quantity Sold by Payment Method**
- **Product Line vs. Quantity Sales**

Technologies Used

- **Python** (pandas, numpy, matplotlib, seaborn, statsmodels)
- **Colab** for data analysis and visualization
- **GitHub** for version control

How to Run the Project

1. Clone the repository:
2. git clone <repository-link>

3. cd supermarket-sales-analysis
4. Install required dependencies:
5. pip install -r requirements.txt
6. Run the Jupyter Notebook:
7. jupyter notebook
8. Open pythonproject1.ipynb and execute the cells.

Business Recommendations

- Introduce discounts on **low-performing product lines** to boost sales.
- Optimize stock levels based on **peak sales periods** identified in time-series analysis.
- Improve customer retention by analyzing **customer preferences and payment method trends**.

License

This project is for educational and research purposes. Feel free to modify and use it!
