25/01/25

Program to implement time series data for import library, load data,Preprocessing and visualising

Aim:

Write a program to implement time series data for import library, load data, Preprocessing and visualising.

Algorithm:

1. Import Libraries: Load pandas, matplotlib.pyplot, seaborn, and files for data handling and visualization.
2. Upload & Read Data → Upload the dataset manually and read it using pd.read_csv().
3. Generate a sale_date column for time series analysis, Rename columns for consistency, Create a DataFrame with relevant columns (sale_date, sale_price).
4. Compute a 7-day moving average to smooth fluctuations.
5. Visualize the Data: Sales Over Time Plot (Daily sales trend).
6. Execute the Program: Analyze sales patterns and trends over time.

Code:

import pandas as pd

import matplotlib.pyplot as plt

import seaborn as sns

from google.colab import files

uploaded = files.upload()

file_path = "artmarket.csv"

df = pd.read_csv(file_path)

df["sale_date"] = pd.date_range(start="2023-01-01", periods=len(df), freq="D"

df.rename(columns={"Price ($)": "sale_price"}, inplace=True)

df_time_series = df[["sale_date", "sale_price"]].copy()

df_time_series["rolling_avg"] = df_time_series["sale_price"].rolling(window=7).mean(

sns.set_style("whitegrid")

plt.figure(figsize=(14, 6))

plt.plot(df_time_series["sale_date"], df_time_series["sale_price"], marker="o", linestyle="-", color="royalblue", alpha=0.7, label="Daily Sales")

plt.xlabel("Date", fontsize=12)

plt.ylabel("Total Sales Price ($)", fontsize=12)

plt.title("📈 Art Market Sales Over Time", fontsize=14, fontweight="bold")

plt.xticks(rotation=45)

plt.legend()

plt.grid(True, linestyle="--", alpha=0.5)

plt.show()

plt.figure(figsize=(14, 6))

plt.plot(df_time_series["sale_date"], df_time_series["sale_price"], label="Daily Sales", alpha=0.5, color="steelblue")

plt.plot(df_time_series["sale_date"], df_time_series["rolling_avg"], label="7-Day Moving Average", color="crimson", linewidth=2)

plt.xlabel("Date", fontsize=12)
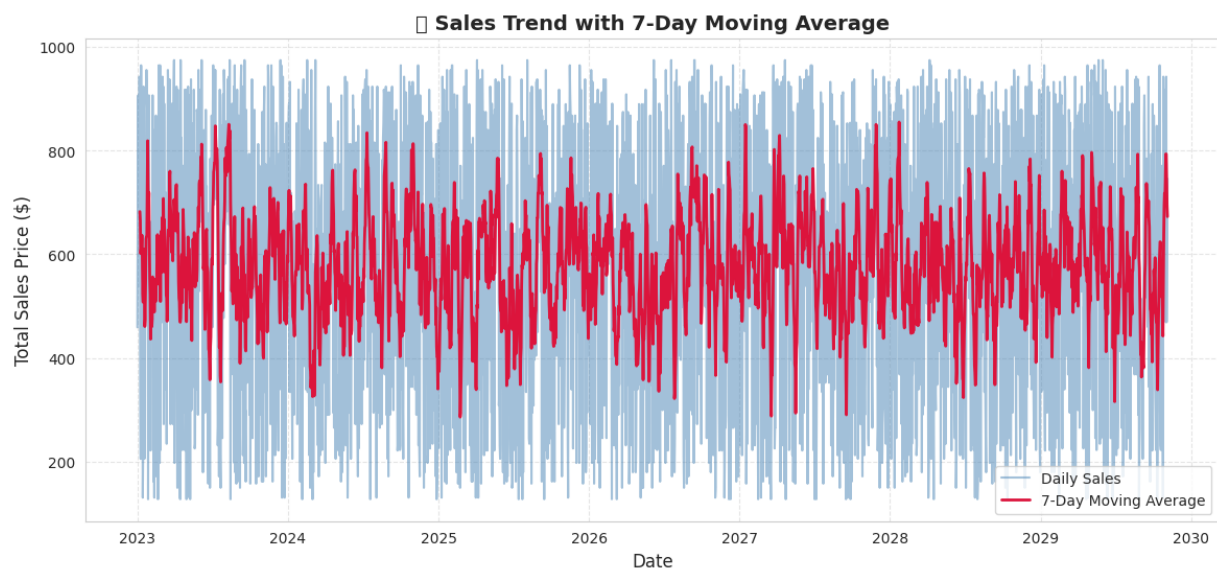
plt.ylabel("Total Sales Price ($)", fontsize=12)

plt.title(" 📊 Sales Trend with 7-Day Moving Average", fontsize=14, fontweight="bold")

plt.legend()

plt.grid(True, linestyle="--", alpha=0.5)

plt.show()

output:

Result:

Thus, the program using the time series data implementation has been done successfully.