**EXP : 5**

**DATE : 27.03.2025**

**IMPLEMENT PROGRAMS FOR ESTIMATING & ELIMINATING TREND**

**IN TIME SERIES DATA- AGGREGATION, SMOOTHING**

**AIM:**

Implement programs for estimating & eliminating trend in time series data- aggregation, smoothing

**PROCEDURE:**

**STEP 1:** CREATE SAMPLE DATA

import pandas as pd

import numpy as np

import matplotlib.pyplot as plt

from statsmodels.tsa.api import ExponentialSmoothing

**STEP 2:** TREND ESTIMATION METHODS

file\_path = '/content/LBMA-SILVER.csv'

df = pd.read\_csv(file\_path, parse\_dates=['Date'], index\_col='Date')

df = df.sort\_index()

df = df.sort\_index()

df.plot(title='Original Time Series', figsize=(15,5))

plt.show()

**STEP 3**: DETRENDING (REMOVE TREND)

df\_monthly = df.resample('M').mean()

df\_monthly.plot(title='Monthly Aggregated Time Series', figsize=(10,5))

plt.show()

**STEP 4:** PLOT RESULTS

window\_size = 10

df['Moving\_Avg'] = df.iloc[:, 0].rolling(window=window\_size).mean()

df[['Moving\_Avg']].plot(title='Moving Average Smoothing', figsize=(20,5))

plt.show()

**STEP 5:** SAVE RESULTS (OPTIONAL)

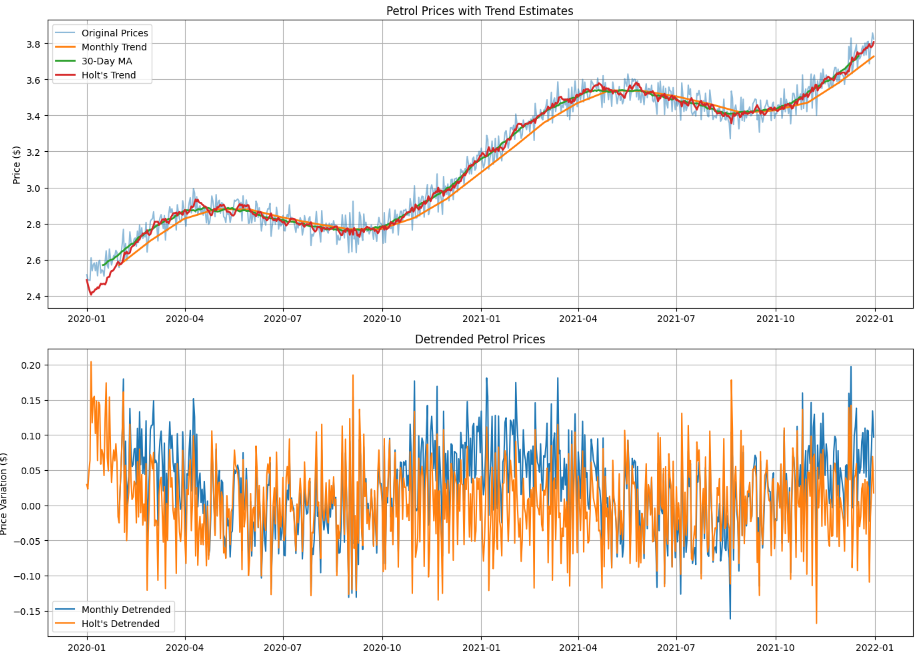
window\_size = 10

df['Moving\_Avg'] = df.iloc[:, 0].rolling(window=window\_size).mean()

df[['Moving\_Avg']].plot(title='Moving Average Smoothing', figsize=(20,5))

print(df.head())

**OUTPUTS:**

****

**RESULT:**

The program to execute estimating & eliminating trend in time series data- aggregation, smoothing has been executed successfully.