# 5**.** Estimating & eliminating trend in time series data- aggregation, smoothing

**AIM:**

Implement programs for estimating & eliminating trend in time series data- aggregation, smoothing. using the given dataset

**PROCEDURE & CODE:**

*1.Import all necessary lib.*

import pandas as pd

import matplotlib.pyplot as plt

*2.Load and preprocess the data*

file\_path = '/mnt/data/dataset.csv'

data = pd.read\_csv(file\_path)

data['Date'] = pd.to\_datetime(data['Date'])

data.set\_index('Date', inplace=True)

*3.Aggregation: Resampling by week (W) and month (M) for trend estimation*

weekly\_data = data['Close'].resample('W').mean()

monthly\_data = data['Close'].resample('M').mean()

*4.Smoothing: Moving Average and Exponential Smoothing*

data['MA\_7'] = data['Close'].rolling(window=7).mean() # 7-day moving average

data['EMA\_7'] = data['Close'].ewm(span=7, adjust=False).mean()

*5. Plotting the original and smoothed data*

fig, ax = plt.subplots(2, 1, figsize=(14, 10))

*5. Plot original vs smoothed data*

ax[0].plot(data.index, data['Close'], label='Original Close Price', color='blue')

ax[0].plot(data.index, data['MA\_7'], label='7-Day Moving Average', color='orange')

ax[0].plot(data.index, data['EMA\_7'], label='7-Day Exponential Smoothing', color='green')

ax[0].set\_title('Original vs Smoothed Data')

ax[0].legend()

*6.Plot weekly and monthly aggregation*

ax[1].plot(weekly\_data.index, weekly\_data, label='Weekly Aggregation', color='purple')

ax[1].plot(monthly\_data.index, monthly\_data, label='Monthly Aggregation', color='red')

ax[1].set\_title('Trend Estimation with Aggregation')

ax[1].legend()

plt.tight\_layout()

plt.show()