# 7**.** Decomposing time series data into trend and seasonality.

**AIM:**

Implement program for decomposing time series data into trend and seasonality.

**PROCEDURE & CODE:**

*1.Import all necessary lib.*

import numpy as np

import pandas as pd

import matplotlib.pyplot as plt

from statsmodels.tsa.seasonal import seasonal\_decompose

*2.Load and preprocess the data*

file\_path = "/content/dataset.csv"

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

# Convert 'Date' to datetime format and set it as index

df['Date'] = pd.to\_datetime(df['Date'], format='%m/%d/%Y')

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

*3.Perform decomposition on the 'Close' price*

result = seasonal\_decompose(df['Close'], model='additive', period=30) # Assuming monthly seasonality

*4.Plot the decomposition*

plt.figure(figsize=(10, 8))

plt.subplot(411)

plt.plot(df['Close'], label='Original Data')

plt.legend()

plt.subplot(412)

plt.plot(result.trend, label='Trend', color='red')

plt.legend()

plt.subplot(413)

plt.plot(result.seasonal, label='Seasonality', color='green')

plt.legend()

plt.subplot(414)

plt.plot(result.resid, label='Residuals', color='blue')

plt.legend()

plt.tight\_layout()

plt.show()

**OUTPUT**

