EXERCISE NO.: 07
DECOMPOSITION OF TIME SERIES DATA

AIM:
To implement a program for decomposition of time series data into trend and seasonality.

PROCEDURE:

1. Import the necessary libraries.

   ```
   import pandas as pd
   import matplotlib.pyplot as plt
   from statsmodels.tsa.seasonal import seasonal_decompose
   ```

2. Load the dataset.

   ```
   df = pd.read_csv('/amazon.csv', encoding='latin1')
   ```

3. Preprocess the data.

   ```
   month_map = {
     'Janeiro': 'January', 'Fevereiro': 'February', 'Março': 'March',
     'Abril': 'April', 'Maio': 'May', 'Junho': 'June',
     'Julho': 'July', 'Agosto': 'August', 'Setembro': 'September',
     'Outubro': 'October', 'Novembro': 'November', 'Dezembro': 'December'
   }

   df['month'] = df['month'].map(month_map)
   df['date'] = pd.to_datetime(df['month'] + ' ' + df['year'].astype(str), format='%B %Y')
   df.set_index('date', inplace=True)

   df_monthly = df.resample('ME')['number'].sum()
   ```

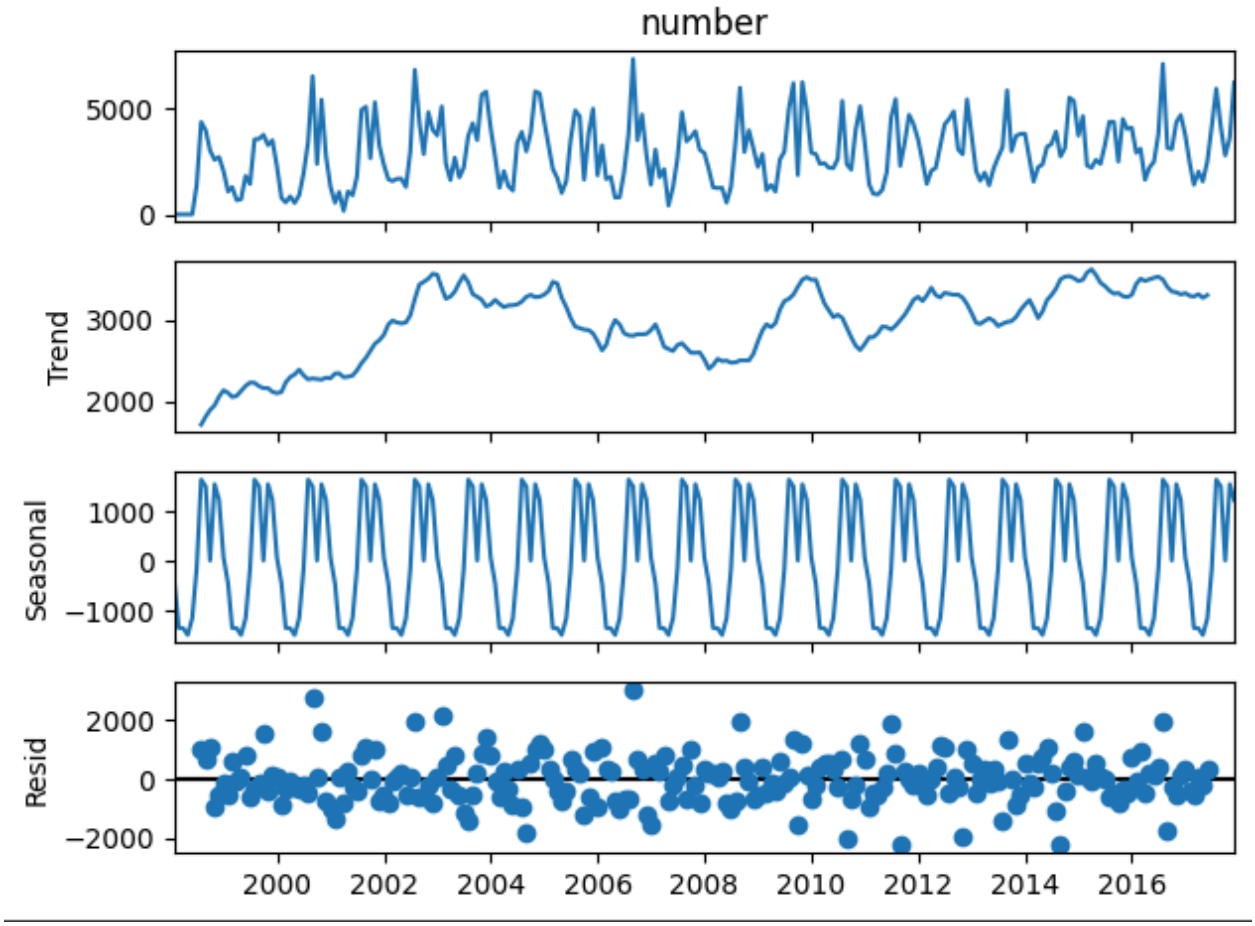
4. Decompose the time series data.

   ```
   decomposition = seasonal_decompose(df_monthly, model='additive')
   ```

5. Visualise the decomposition.

   ```
   decomposition.plot()
   plt.show()
   ```

OUTPUT:



RESULT:

Thus the program has been successfully implemented and verified.