ASSIGNMENT 1

ECON 102

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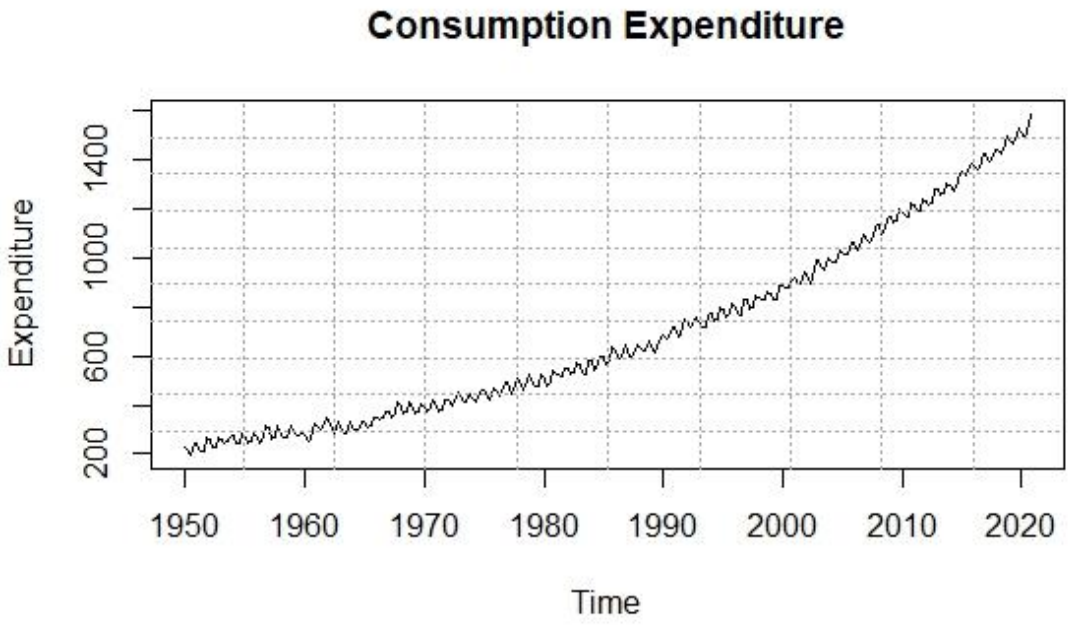
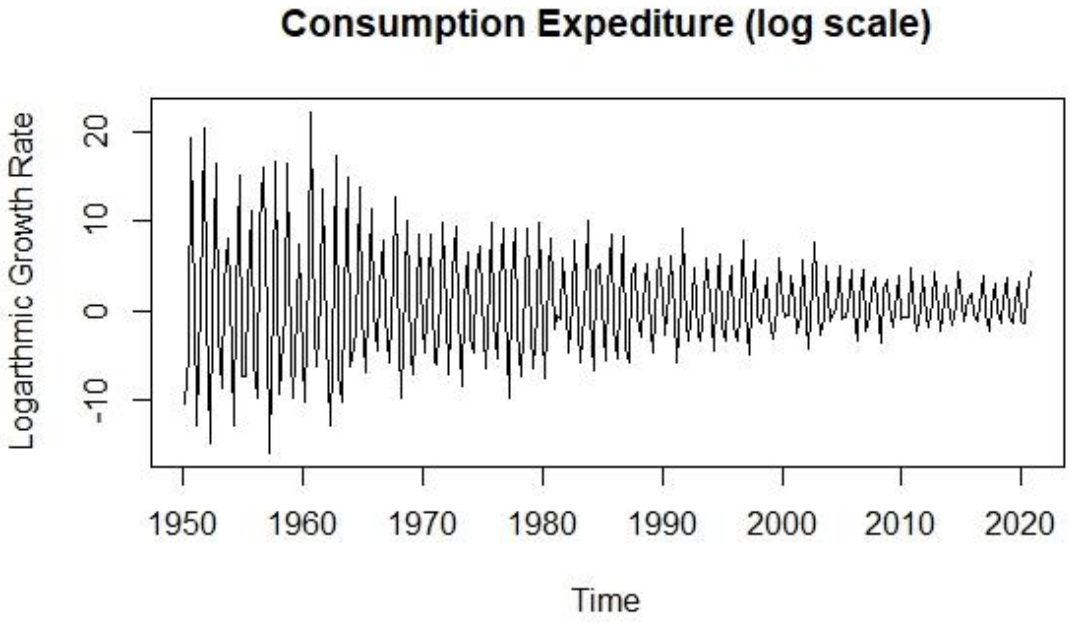
tveliche

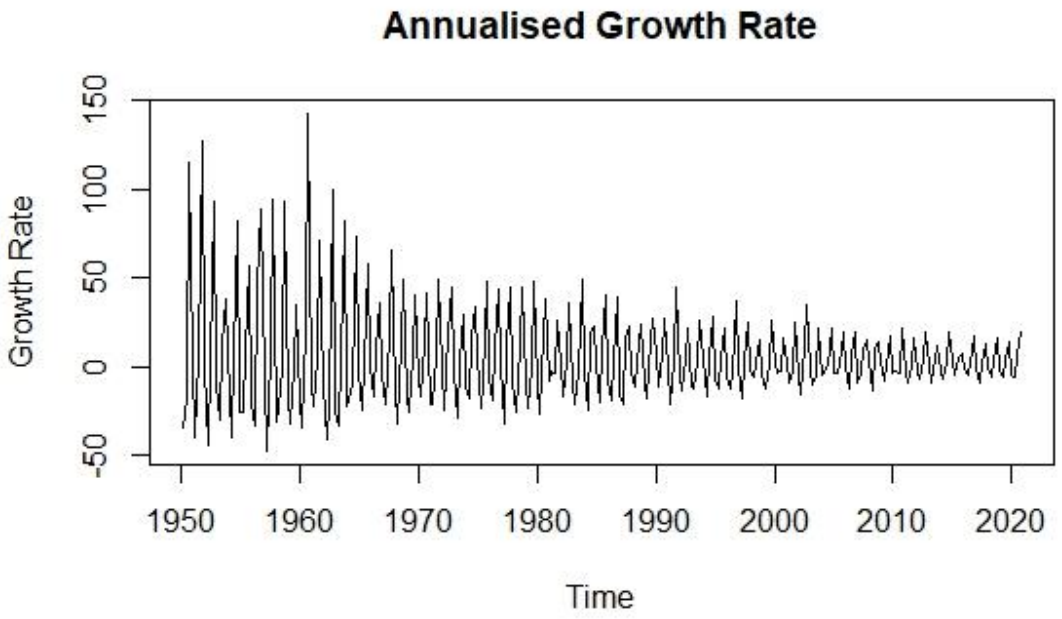
Part-A Visualization:



1) The above graph is the plot of time series represented using a line chart over a period. It has positive trend which has fluctuations are quarterly fluctuations that are not highly volatile.



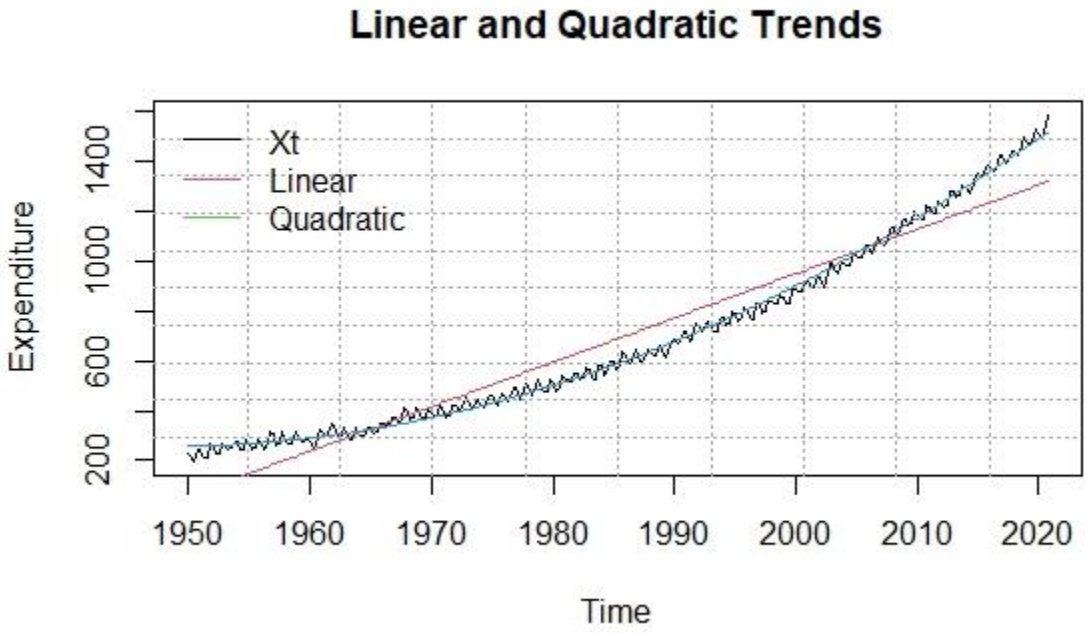
2) The above graph shows us the logarithmic growth rate of the time series, Initially, the growth rate fluctuations are volatile but over the period they are less volatile. The growth rate is constant on average over time.



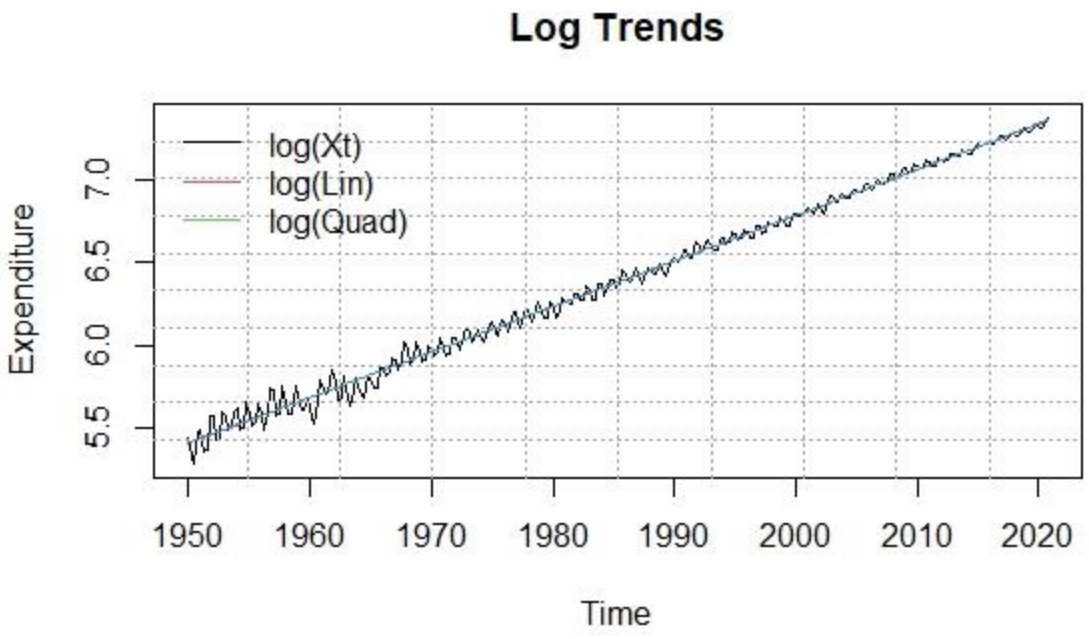
3) The annualized growth rate of the consumption expenditure quarterly series is shown in the graph above. It has high fluctuations at the beginning and then later the fluctuations reduce. The growth rate is constant on an average over time.

Part-B

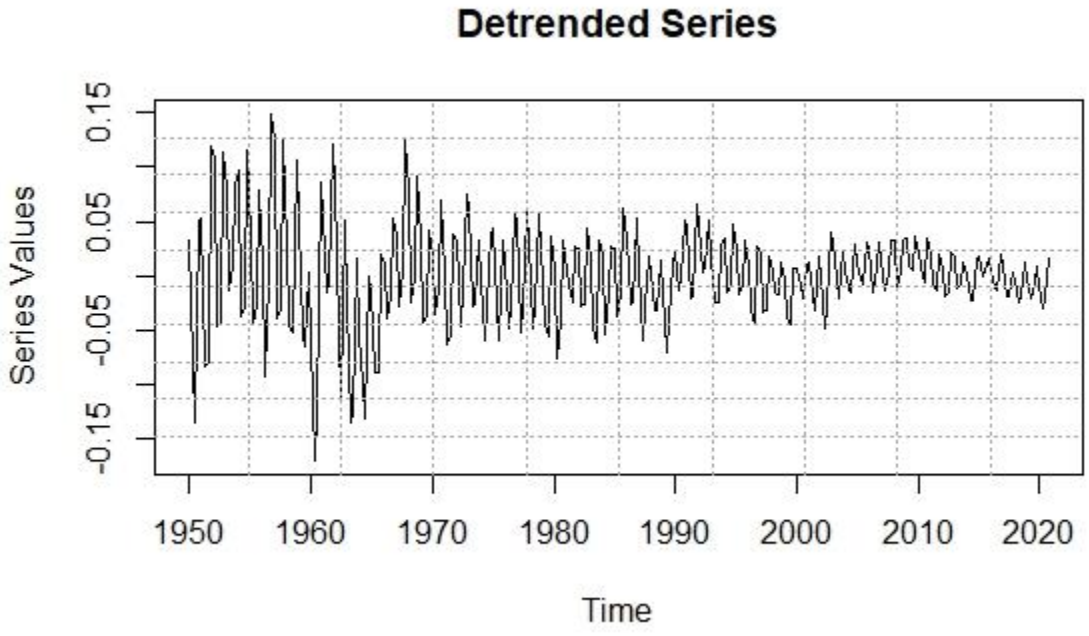
Time Series Decomposition:



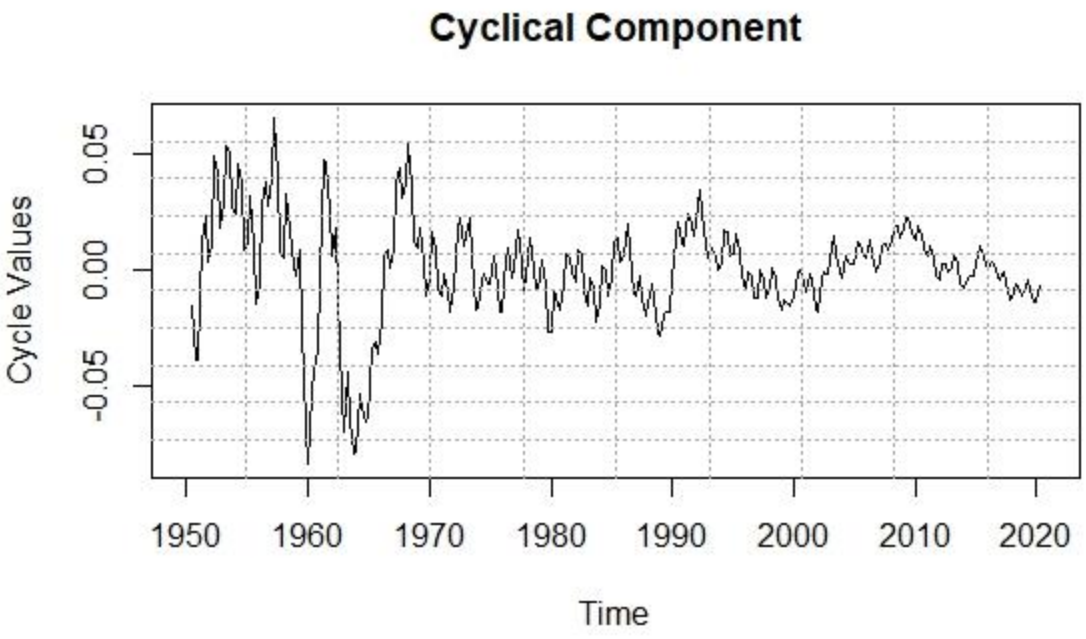
1) The Linear and Quadratic trends are plotted along with the series expressed as line chart; the quadratic trend seems to be the best fit for the series. The coefficient of the quadratic trend is positive indicating that it is increasing. It represents the average values of the series better than the linear trend.



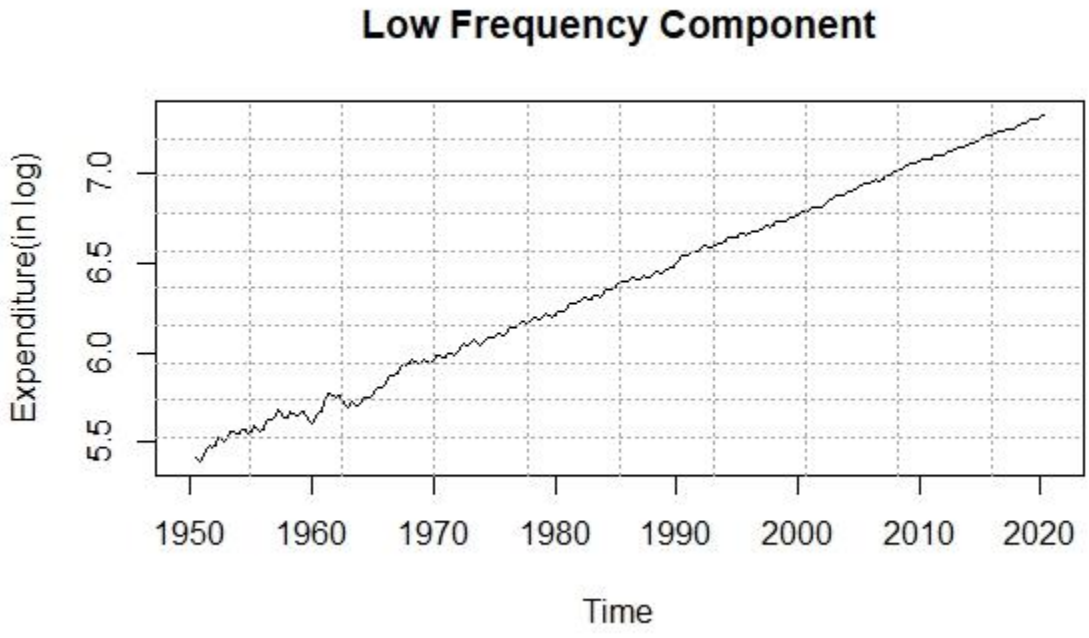
2) The logarithmic linear and quadratic trends for the consumption expenditure time series, unlike the previous plot, the linear trend is better fitting to the log series. The values corresponding to the quadratic and linear series are very close (as we see, they seem to overlap on the graph).



3) The plot for the detrended series shows us the series after the lowest frequency componentize, the trend is removed. We can see that the short-term fluctuations are more clearly visible compared to the series before removing the trend.



4) The cyclic component shown in the graph above represents the average movement of the consumption expenditure series around its trend. Some of the crusts and trough values:
   Attains a peak value of 0.48 around the period 1961,
   Falls to a value of -0.04 in 1951,
   Attains a peak value of 0.05 just to the left of 1970,
   Falls to -0.01 during 1970.

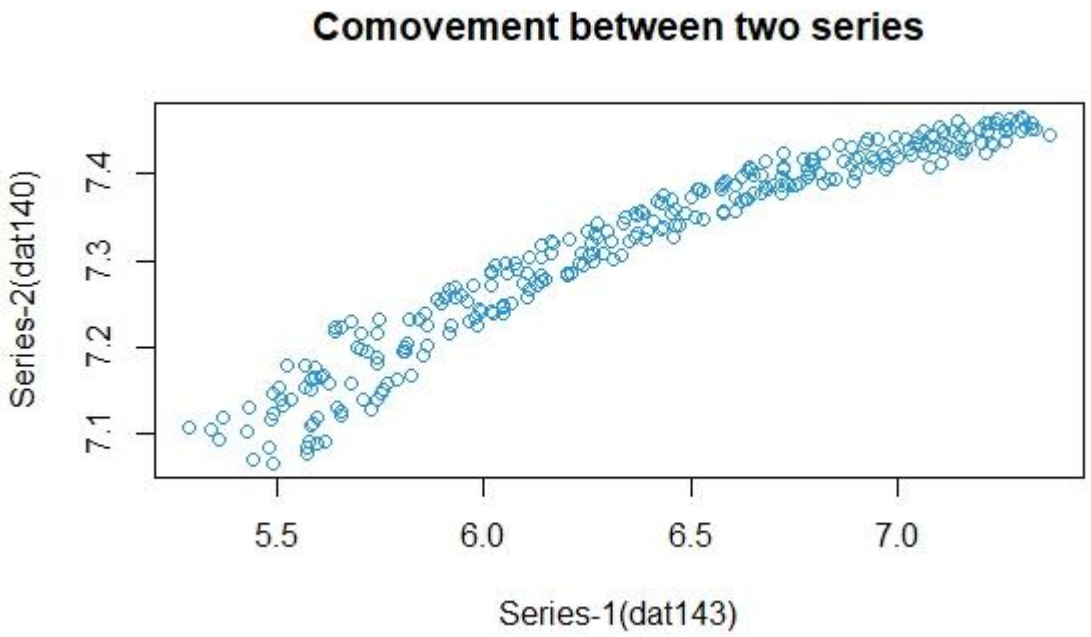


5) The low frequency component of the series is the sum of the Trend and the Cyclical component, we see the graph which looks like series plotted but with lesser fluctuations.

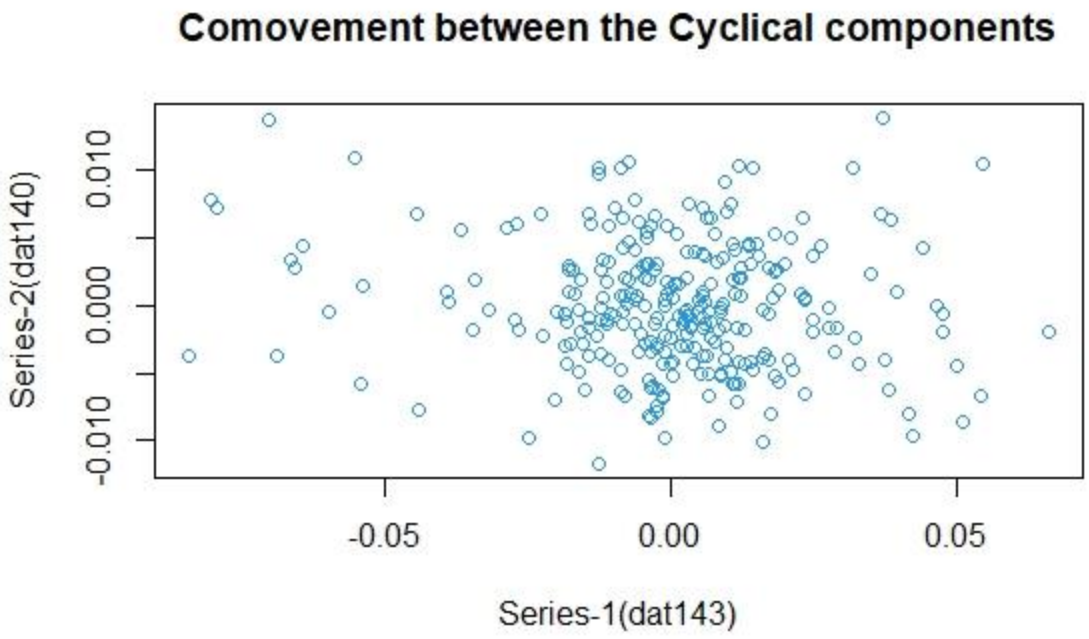
6) The four seasonal values of the seasonal components are:
   a) Quarter-1: 0.029
   b) Quarter-2: -0.045
   c) Quarter-3: -0.035
   d) Quarter-4: 0.05

Part-C

Comovement:



1) Scatter Plot of both series expressed in logs.



2) The Scatter plot of the cycles of both the series.

3) The first scatter plot has positive comovement between both the series but after removing the trend component, there is not as positive comovement in the second plot. It means that there not much relationship between both the series even though they both are increasing over time.