Mini Project-2

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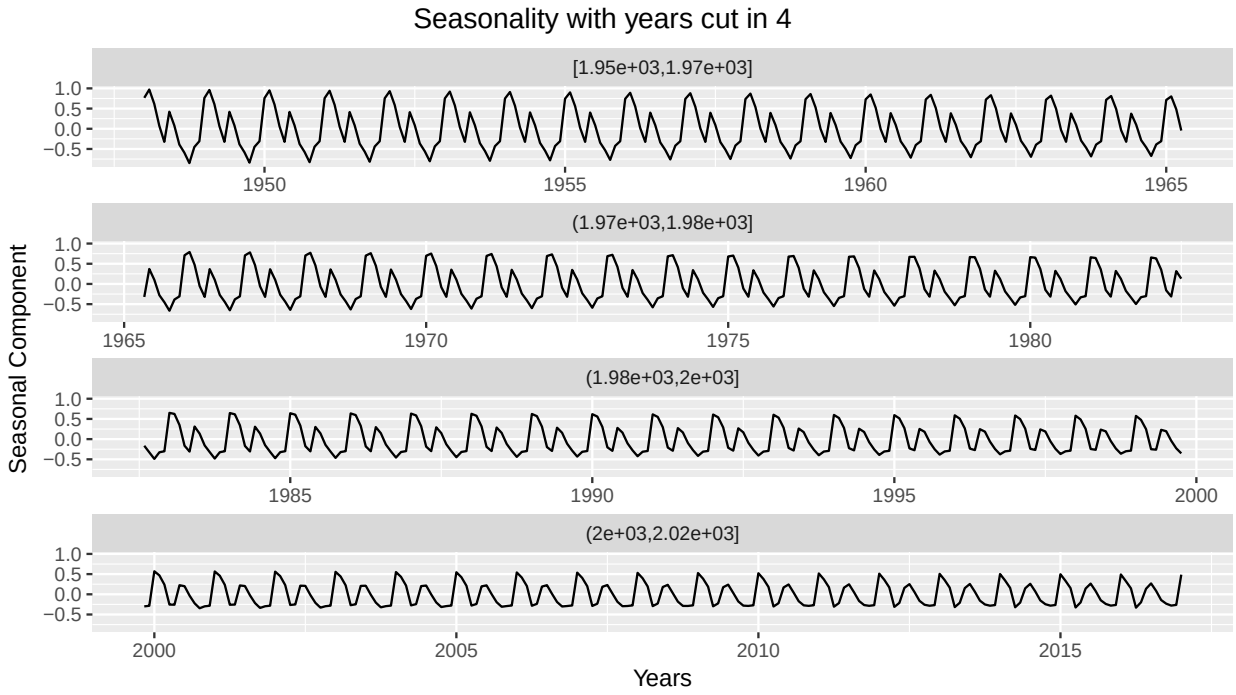
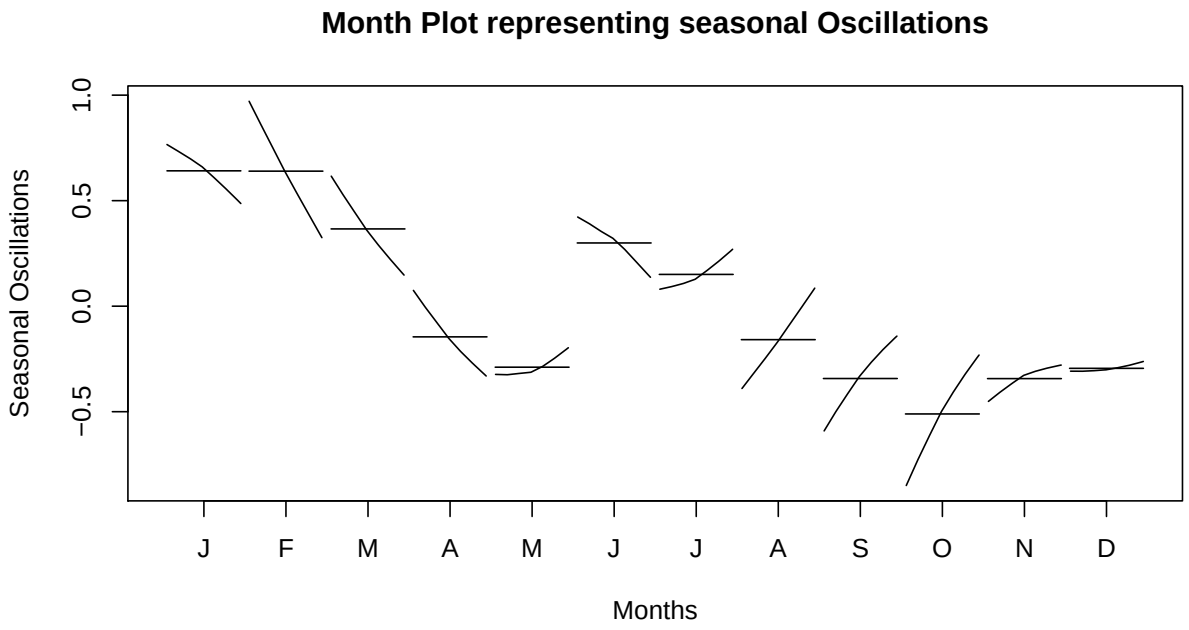
Q.1

We decompose the time series to its following fundamental components
1. Seasonality
2. Trend
3. Oscillations
4. Remainder

Seasonality

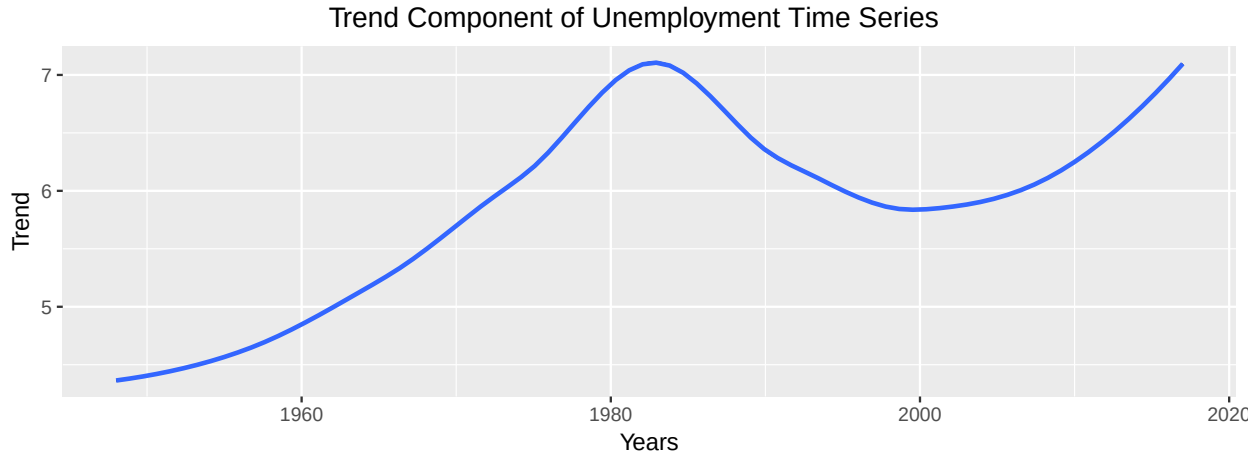


We observe seasonality in our data, as expected, which appears to be decreasing with time. It is also noticeable that there is large variation in seasonality for all months, except for the months of May and December.



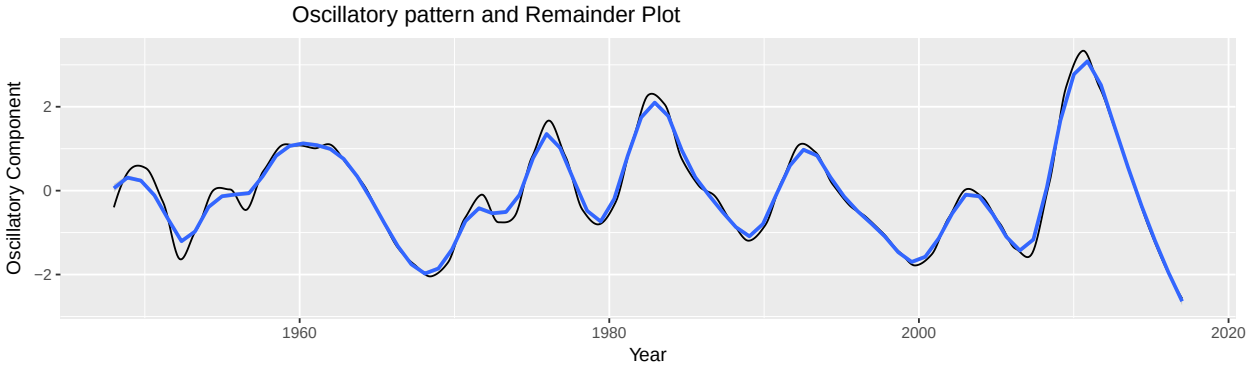
Trend

Since, we have data for several decades, we do not observe a clear trend in the data. We observe that the graph is increasing up to the year 1970, after which it decreases till 1985. Thereafter, we see that the graph is increasing up to the year 2017. So, we can conclude that the plot is not monotonic.



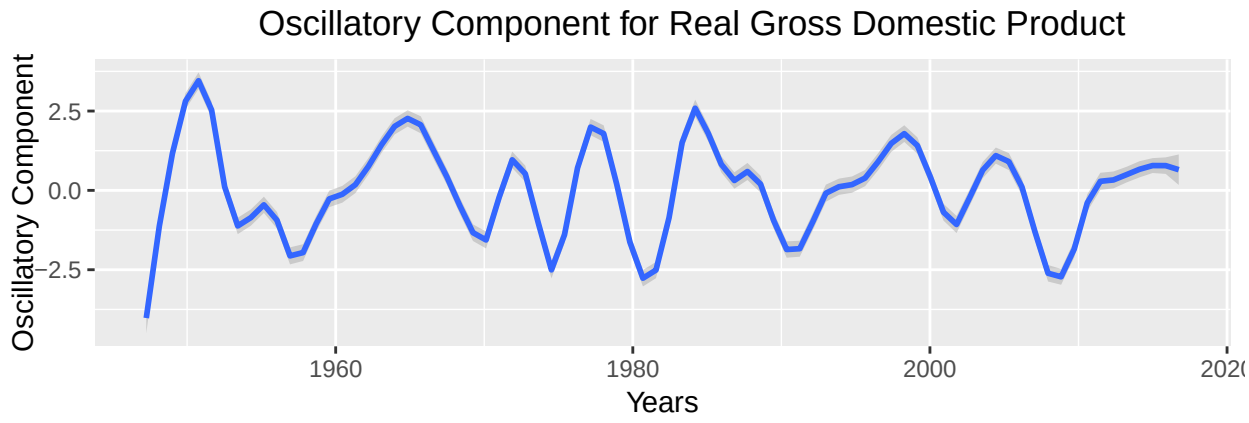
Oscillations

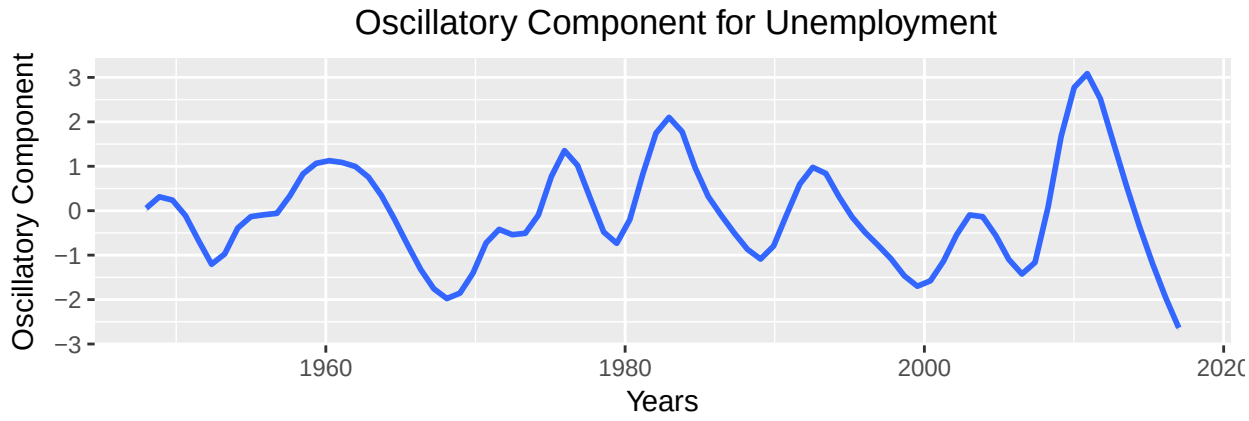
We observe about six or seven cycles in our data, as seen by plotting the fitted values of the third-order loess.



Q.2

GDP as a predictor of Unemployment rate





Economically thinking, there should be a correlation between the change in RGDP (Real Gross Domestic Product) and the unemployment rate. We obtained quarterly seasonally-adjusted data for RGDP (Percent change from preceding period) from April 1947 to January 2017. Having seasonally-adjusted data simplifies our analysis, since we are no longer required to account for the seasonal component.