Batch: C-2	**Roll No.: 16010122267**
Experiment 05	

Title: Working with time-series data.

Objective:

1. *Search/locate and download the time series Data*
2. *To learn how to visualize time series data*
3. *Applying trend line over visualized time series data using analytics options*
4. *Perform forecast over the time series using analytics options*

Course Outcome:

CO1: Learn how to locate and download datasets, extract insights from that data and present their findings in a variety of different formats.

CO3 Apply data visualization best practices

Books/ Journals/ Websites referred:

https://help.tableau.com/current/pro/desktop/en-us/trendlines_add.htm

Resources used:

https://www.kaggle.com/shenba/time-series-datasets?select=Electric_Production.csv

Theory:

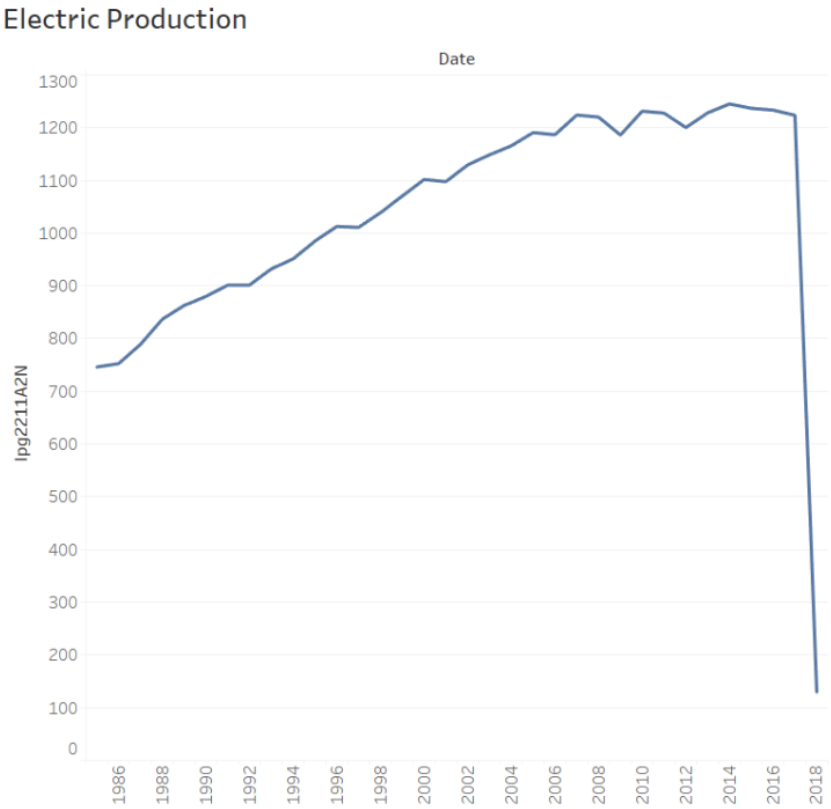
Definition Time series:

A time series is a sequence of data points that occur in successive order over some period. This can be contrasted with cross-sectional data, which captures a point-in-time.

In investing, a time series tracks the movement of the chosen data points, such as a security's price, over a specified period of time with data points recorded at regular intervals. There is no minimum or maximum amount of time that must be included, allowing the data to be gathered in a way that provides the information being sought by the investor or analyst examining the activity.

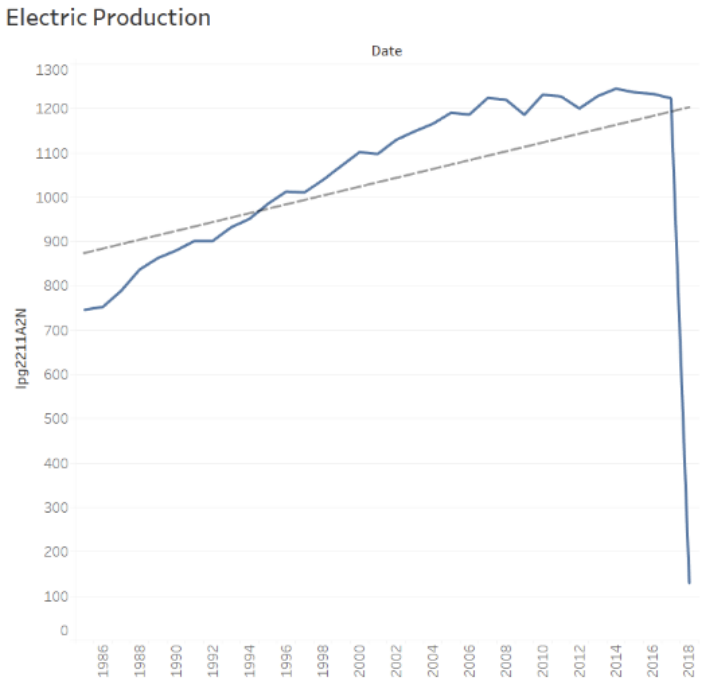
Following points should be written by students

1. Observation after plotting of time series data

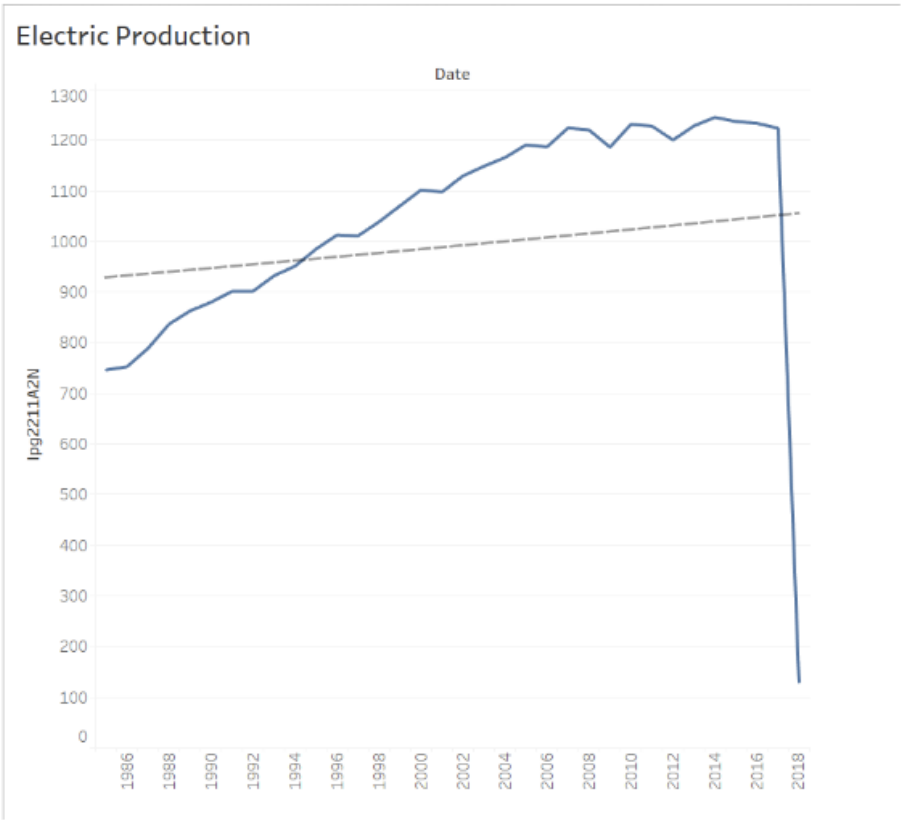


2. Observation after plotting trend line (Linear, Exponential and polynomial)

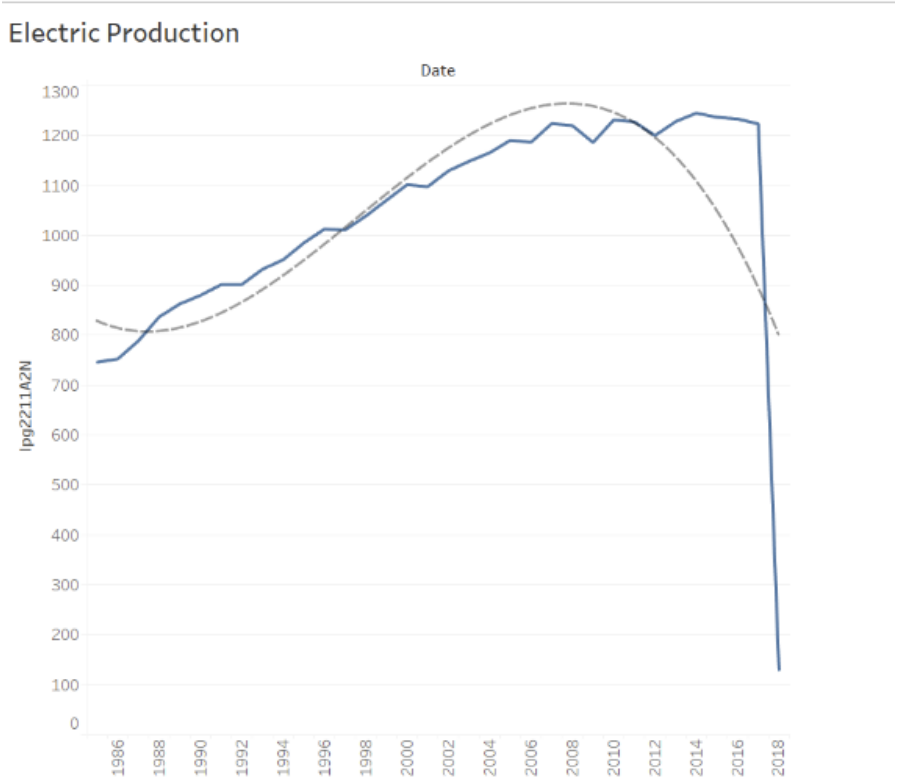
i. Linear trend line



ii. Exponential trend line

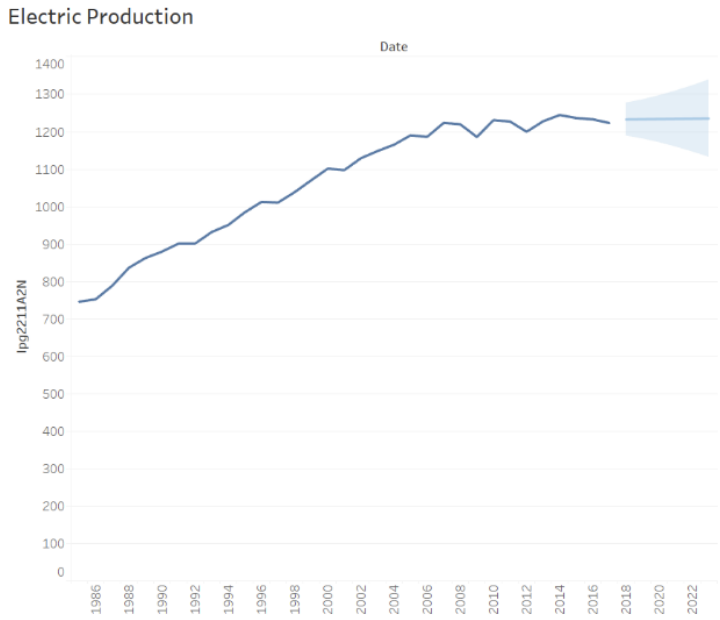


iii. Polynomaial trend line

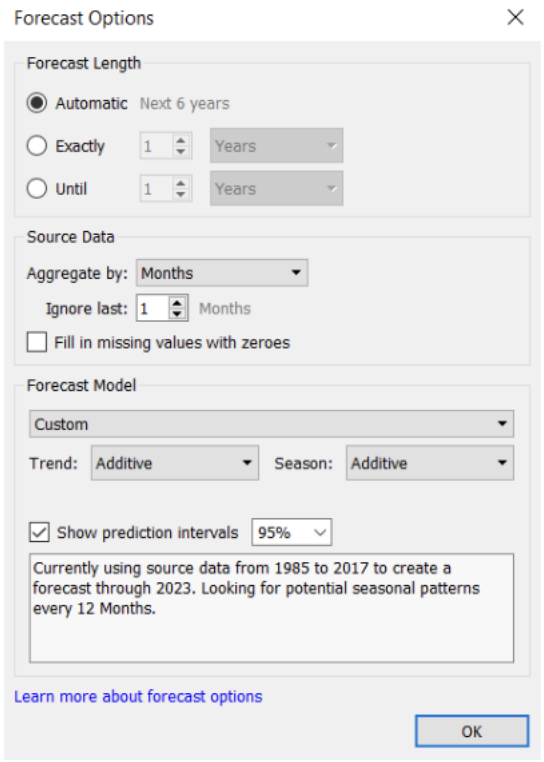


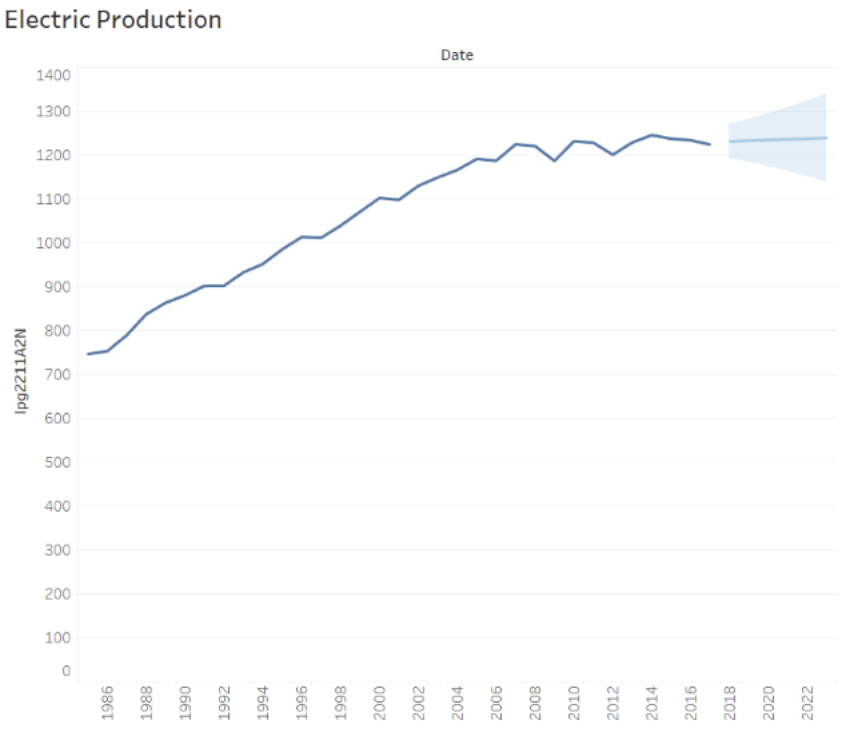
3. Observation after Forecast (Automatic, Additive, and multiplicative, along with season options)

i. Automatic forecast

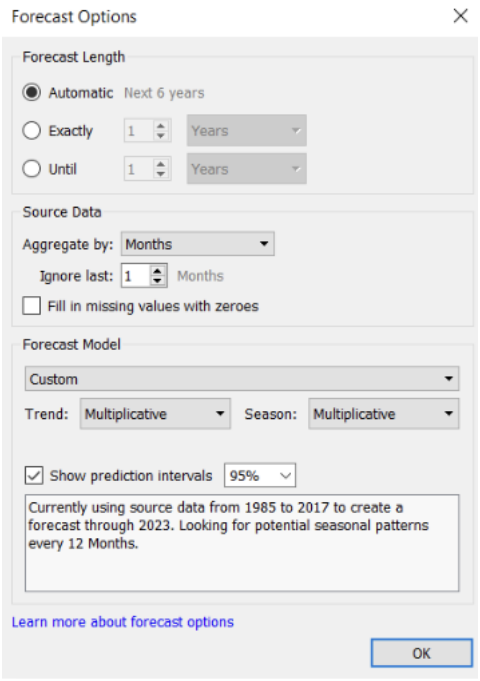


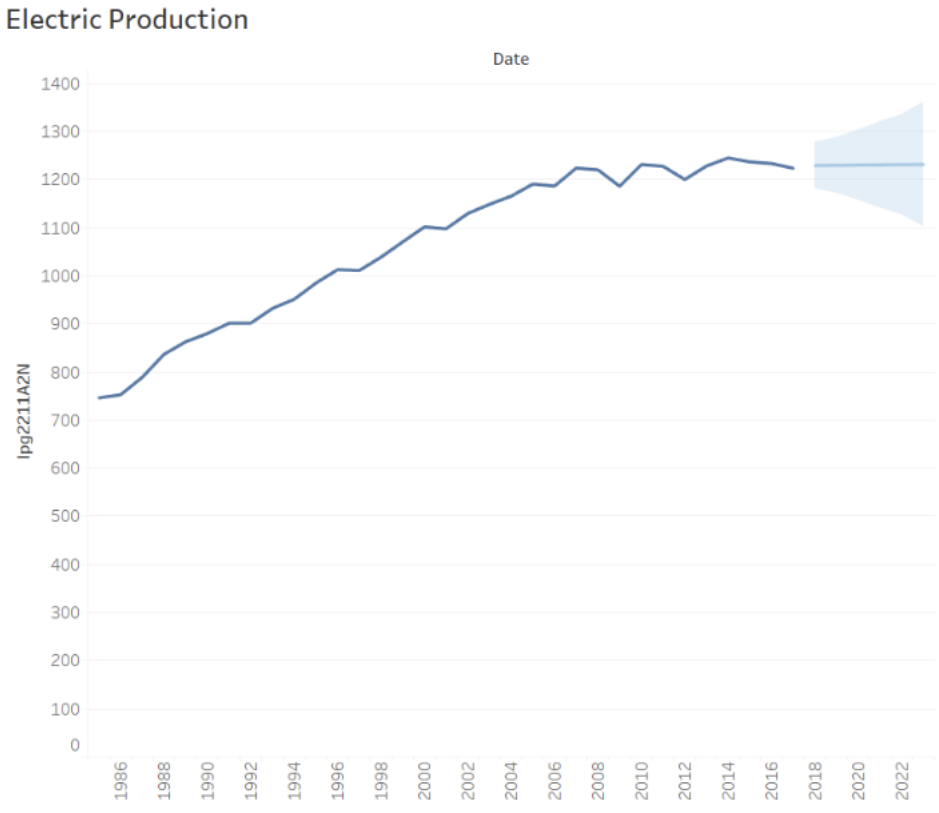
ii. Additive forecast





iii. Multiplicative forecast





Note: Detail observation needed along screenshots wherever required

Conclusion:

Thus, we understood how to visualize time series data and performed different functions on the time series data set and predicted data as well.

Date: _____ **Signature of faculty in-charge**

Post Lab Question:

1. **Compare the additive and multiplicative model of time series**

ADDITIVE MODEL	MULTIPLICATIVE MODEL
An additive model is a time series in which the magnitude of the seasonal fluctuations does not vary with level of time series.	The multiplicative model is a time series in which seasonal fluctuations increase or decrease proportionally with increase and decrease in the level of the series.
Data is represented in terms of addition of seasonality, trend, cyclical, and residual components to give the observed series.	Data is represented in terms of multiplication of seasonality, trend, cyclical and residual component to give the observed series.
Used where change is measured in absolute quantity.	Used where change is measured in percentage (%) change.
Data is modelled as-is.	Data is modelled just as additive but after taking logarithm (with base as natural or base 10).
The additive model works best when the time series has roughly the same variability through the length of the series. That is, all the values of the series fall within a band with constant width centred on the trend.	The multiplicative model works best when the variability of the time series increased with the level. That is, the value of the series becomes larger as the trend increases.