**Batch: C3 Roll No.: 16010120193**

**Experiment 05**

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| **Title: Working with time-series data** |

# Objective:

# *Search/locate and download the time series Data*

# *To learn how to visualize time series data in Tableau*

# *Applying trend line over visualized time series data using analytics options in tableau*

# *Perform forecast over the time series using analytics options in tableau*

# 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:

Dataset: from Kaggle

<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](https://www.investopedia.com/terms/c/cross_sectional_analysis.asp), 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

# Observation after plotting of time series data

# Chart, line chart Description automatically generated

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

# Linear trend line

# Chart, line chart Description automatically generated

# Exponential trend line

# Chart, line chart Description automatically generated

# Polynomial trend line

# Chart, line chart Description automatically generated

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

# Automatic forecast

# Chart, line chart Description automatically generated

# Additive forecast

# Graphical user interface, text, application, email Description automatically generated

# Chart, line chart Description automatically generated

# Multiplicative forecast

# Graphical user interface, text, application, email Description automatically generated

# Chart, line chart Description automatically generated

# 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.

# Post Lab Question:

# Compare the additive and multiplicative model of time series

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| **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. |

**Date: 17-11-2021 Signature of faculty in-charge**