

Week 1: Time Series Analysis (Total video duration= 2.5 hours. You will be required to spend 30 minutes/day along with practicing datasets and quizzes)

Learning Outcomes from the Module:

After learning from this module, learners will be able to understand:



Why is forecasting important and how to forecast?



Understanding Time Series data, examples of Time Series Data, Important concepts to remember while gathering time series data.



Dealing with Missing Data in Time Series Analysis and Exploratory Analysis of the same



Understanding Decomposition Models and why is Decomposition important; Trends and Seasonality in Time Series Analysis



Working on Python to read time series data, understanding how decomposition models work on Python and modifying TS forecast range



Mentor Session Duration:
2 hours

Faculty Name:
Dr. Abhinanda Sarkar

No. of videos:
12

Video No.	Video Name	Duration of the video(mins)	Topics Covered	Conceptual or Hands On
1	Why Forecast and How to Forecast	10:51	The need to forecast, what is a time series forecasting method and Quarterly Retail Turnover example to understand the same.	Conceptual
2	What is Time series	5:41	Sequence of measurements made at regular time intervals on the same variable collected over time is Time Series.	Conceptual
3	Examples of Time series	14:36	Time Series examples of Yearly US GDP,	Conceptual
4	Some important concepts to know in Time series	12:03	Collecting multiple items at the same point of time is not a Time Series or when time periods are not same.	Conceptual
5	Missing Data and Exploratory analysis	2:18	Treatment of missing data is important for time series analysis by imputation/averaging/internal forecasting.	Conceptual
6	Components of Time series	11:02	Trend and Seasonality are the Systematic components of Time Series derived from the patterns in the data. There is also an irregular/random component.	Conceptual
7	Decomposition	20:19	Understanding the need to decompose data, what is decomposition model and some examples of it.	Conceptual

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8	How to Read Time Series Data_Hands-on	19:19	Univariate and Multivariate Time Series with Demand dataset and Pollution Dataset.	Hands-on
9	Decomposition of a Time Series in Python_Hands-on	10:36	Additive and Multiplicative Decomposition on Retail Turnover dataset and International Air Passengers dataset.	Hands-on
10	Additive and Multiplicative model - Decomposition Hands_On Case Study	27:51	Decomposing a TS into its descriptive characteristics using Decomposition models- Additive and multiplicative model on Gas Dataset to check for trend, seasonality and errors. Understanding when to use additive and when to use multiplicative models.	Hands-on
11	Missing Data Handling Code Walkthrough	3:50	Understanding how to deal with missing data for time series analysis using Shoe Sales dataset as example.	Hands-on
12	Modifying the Time Series Forecast Range_Hands-on	6:34	forecast() functions returns the forecast value, standard error of model and confidence interval. Understanding resampling and upsampling using Shampoo sales dataset.	Hands-on

Few textbooks that you can refer to:

1

Time Series Analysis

By James Hamilton

2

Introduction to Time Series and Forecasting

by Brockwell and Davis

