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Week 2: Time Series Analysis (Total video duration= 1.06 Hours. You will be required to spend around 12 minutes/day along with practicing datasets and quizzes)

Learning Outcomes from the Module:

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

- Importance of the range of Forecast and its Types
- Model Validation for a Time Series Dataset
- Moving Average forecast and performing Hands-On in Python
- Exponential Smoothing
- Comparing different Forecast models and evaluating their performance through measures like RMSE

Mentor Session Duration:	Faculty Name:	No. of videos:
2 hours	Dr. Abhinanda Sarkar	1.68 hours

Video No.	Video Name	Duration of the video(mins)	Topics Covered	Conceptual or Hands On
1	Forecast Range and Scope	10:12	The range of forecast matters and it should be done for a very long period of time. While gathering historical data, the information should not be from long past or limited in volume	Conceptual
2	Forecast	04:28	Multiple types of forecasting techniques like Naive Forecast, Moving Average Forecast and Average Forecast.	Conceptual
3	Model Validation	07:51	Understanding Model Validation and how Training data is used to identify a few working models which are tested against observed values of the series for a hold out period.	Conceptual
4	Forecast by Average	00:36	Using Average Forecast ignores Trends and Seasonality and naturally does not work in most cases.	Conceptual
5	Introduction to Forecasting_Hands-on	14:12	Building different models on a dataset in a train-test scenario and evaluating those models.	Hands_On
6	Exponential Smoothing Introduction	00:51	Incorporates Trends and Seasonality and gives different parameters of interpretation.	Conceptual

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Video No.	Video Name	Duration of the video (mins)	Topics Covered	Conceptual or Hands On
7	Exponential Smoothing method	16:21	It is a weighted average of past observations where only recent observations matter and weights decay as observations get older. Understanding Holt Winters model and Double Exponential Smoothing.	Conceptual
8	Exponential Smoothing_Hands-on	08:45	Hands-On	Hands-On
9	Concluding Video	00:41	How Time Series is incorporated in Python, how timestamps are created, how seasonal patterns and trends are recovered through decompositions and how they can be directly modelled through differences and linear regression and how they can be measured through RMSE.	Conceptual

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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