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TIME SERIES FORECASTING: Week 2

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DSBA CURRICULUM DESIGN

FOUNDATIONS

- Data Science Using Python
- Statistical Methods for Decision Making

CORE COURSES

- Advanced Statistics
- Data Mining
- Predictive Modelling
- Machine Learning
- Data Visualization
- SQL
- Time Series Forecasting (Week-2/4)

DOMAIN APPLICATIONS

- Financial Risk Analytics
- Marketing Retail Analytics

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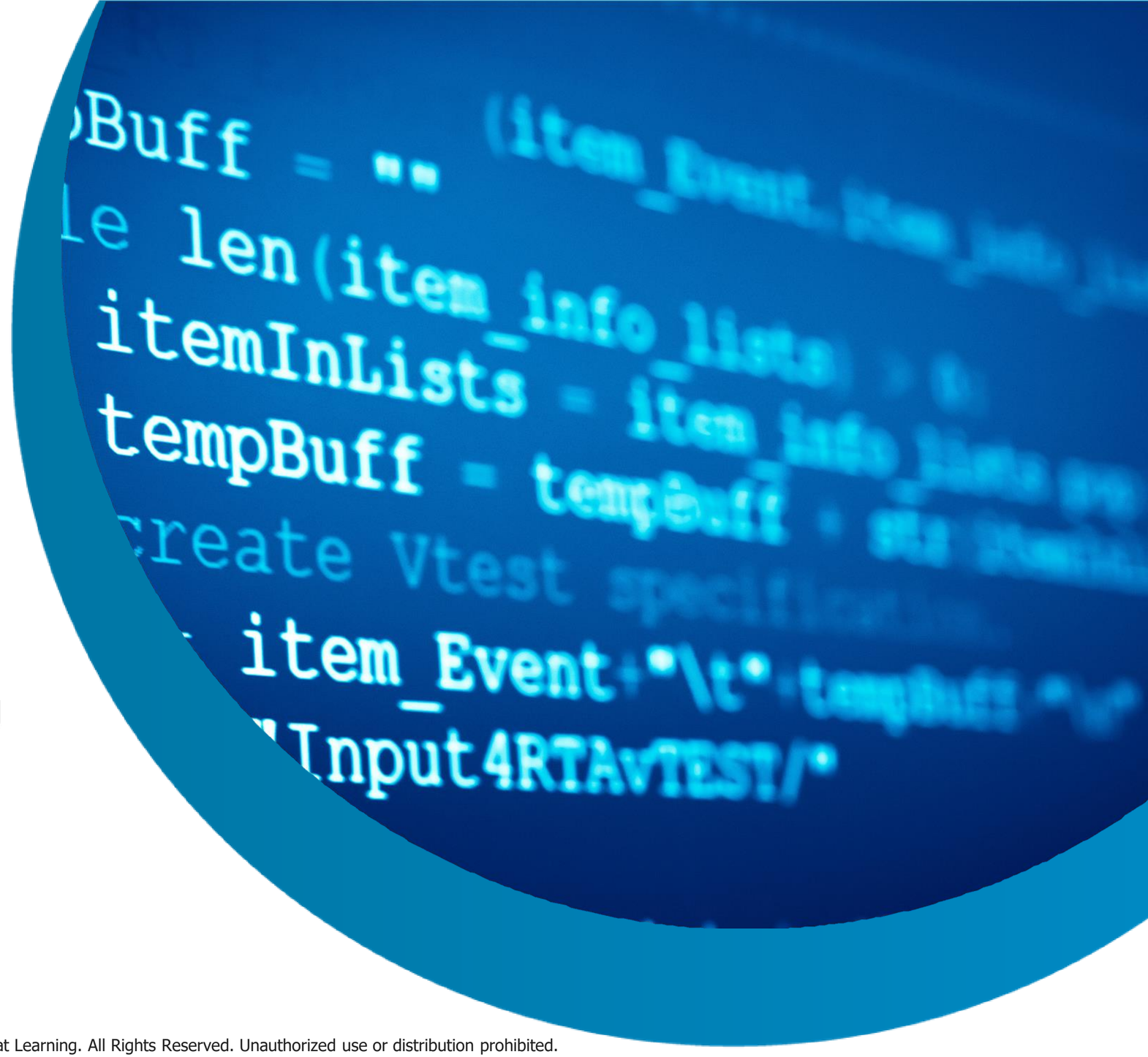
LEARNING OBJECTIVE OF THIS COURSE

- Time Series Analysis
- Time Series Forecasting – Introduction to Forecasting
- ARIMA Models



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LEARNING OBJECTIVES OF THIS SESSION

- Introduction to Time Series Forecasting – Taking advantage of Trend and Seasonality to get better forecasts

- Model Validation using a Train-Test Split

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TRY ANSWERING THE FOLLOWING

- A more complicated model which estimates a lot of parameters usually always performs better (i.e. gives a better accuracy or a less error) on the training data. – True or False? Discuss.

- For Model Validation in a Time Series Forecasting problem, the train and test data can be randomly sampled. True or False? Discuss.

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BROAD OVERVIEW

- Time Series Forecasting equips us with a lot of tools which help us to predict the "*future*".
- We do need to remember one thing that the further we predict into the future, the more unreliable or error-prone our forecasts becomes.
- In this session we will look at a case study, build different models on it and select the best model by looking at the accuracy score (i.e. the least error) on the test data.

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Concept of Confidence Intervals:*

- When we predict certain time points into the future, we might need to have a concept of Confidence Bands/Intervals for our predictions. This gives us range of values in which our predictions will be lying in the future or for the future time stamps.
- We need to answer the questions of, “How confident are we of our predictions?”

Note: A 95% confidence interval tells us that we are 95% confident that our predictions are going to lie within a certain range

*The concept of confidence interval will be covered in the video lectures in the upcoming weeks

Industry Application – Predicting National Income and Government Spending

Time Series Forecasting procedures are often used in Public Policy making. The government has to have to an idea about the national income and the corresponding tax collections. Certain regulations can be changed or altered keeping in mind the upcoming future forecasts. Various economic decisions are taken based on these future predictions. When a model is being fitted for such an application, usually white-box models are preferred.

Video Lecture on using Analytics in Public Policy making.

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CASE STUDY- Predicting the Monthly Sales of a Particular Store.

In this particular case study, we are going to look at some of the descriptive measures of statistics to understand the data a bit better. Then we will go ahead and split the data into training and test. After this, we will build different models on the data and choose the most optimum model.

The objective of this session is to predict the monthly sales of a particular store for some future time stamps.

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ANY QUESTIONS

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HAPPY LEARNING