greatlearning
Learning for Life

TIME SERIES FORECASTING: Week 3

greatlearning
Learning for Life

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-3/4)

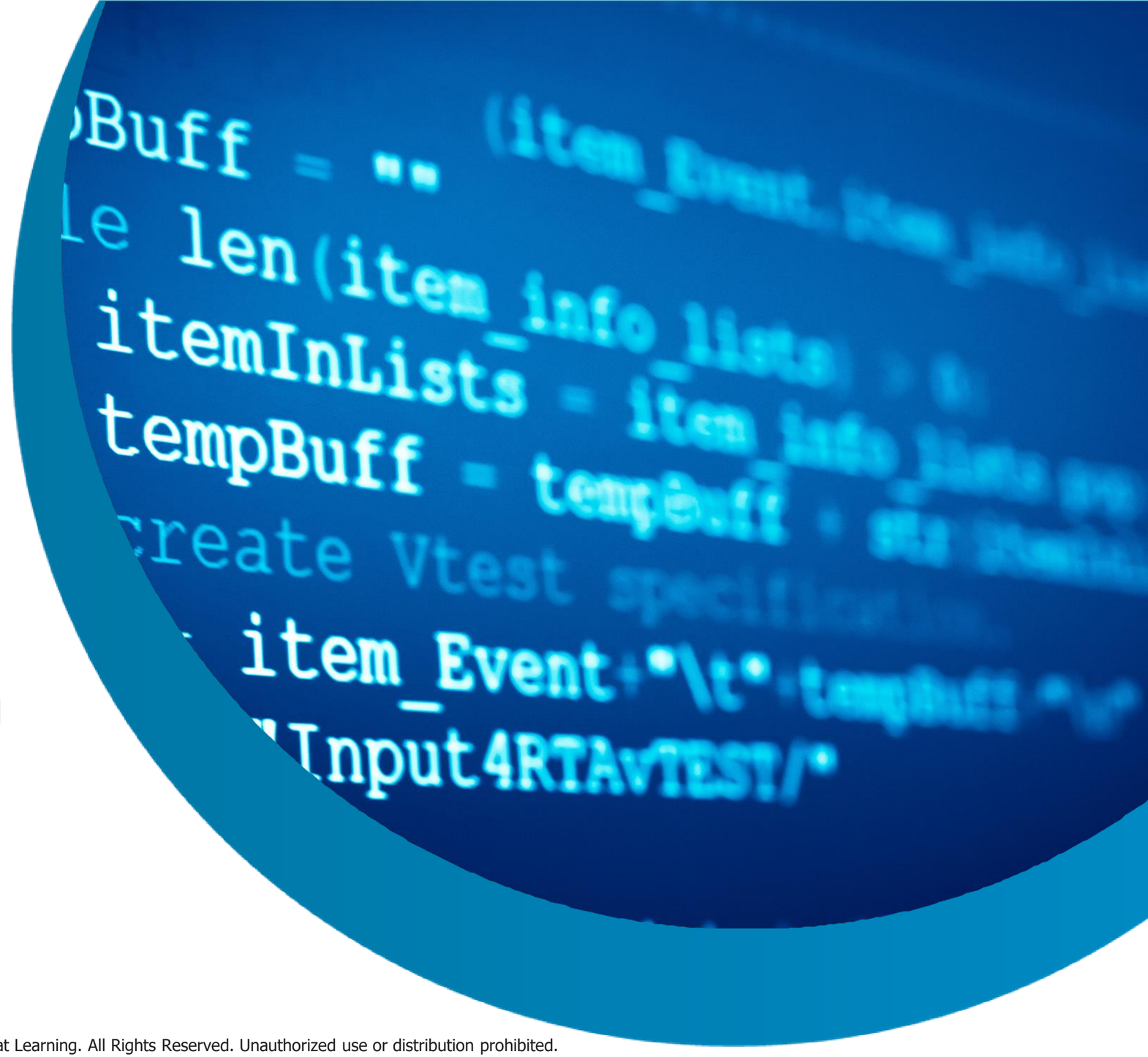
DOMAIN APPLICATIONS

- Finance and Risk Analytics
- Marketing and Retail Analytics

greatlearning
Learning for Life

LEARNING OBJECTIVE OF THIS COURSE

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



greatlearning
Learning for Life

LEARNING OBJECTIVES OF THIS SESSION

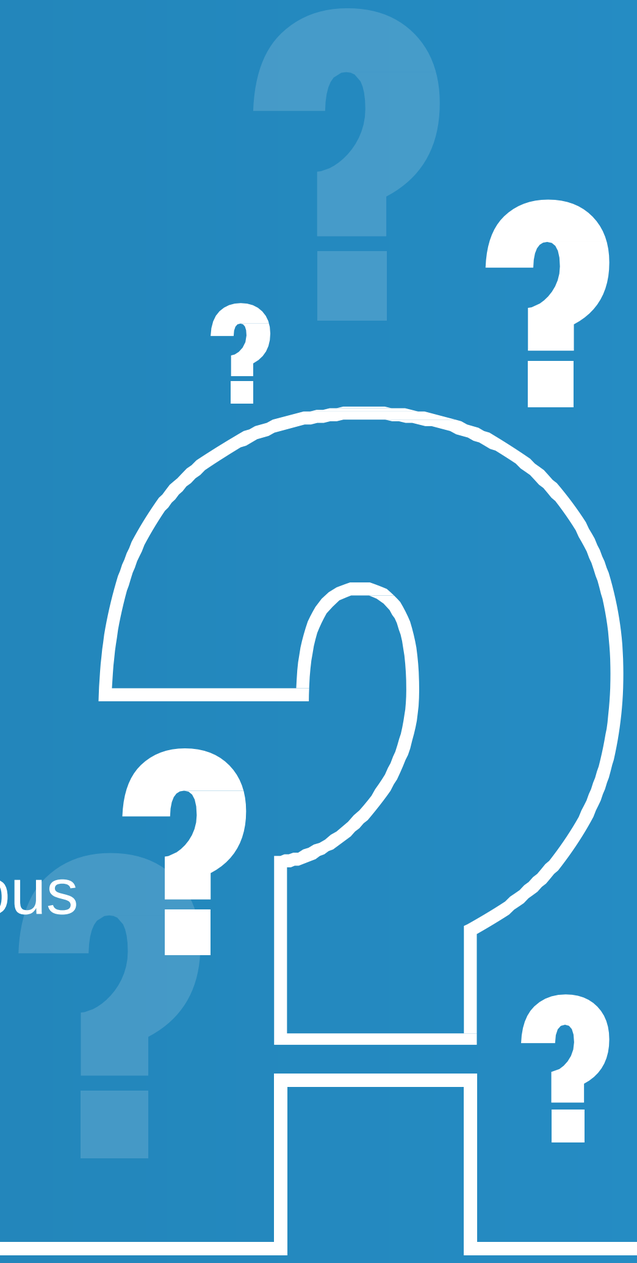
- Concepts of Stationarity, ACF, PACF
- ARIMA models

greatlearning
Learning for Life

TRY ANSWERING THE FOLLOWING

- A model chosen by the lowest AIC values (an auto ARIMA) will always give better results for prediction on the test data as compared to a model chosen by looking at where the ACF and the PACF cuts-off. True or False? Discuss

- All models are ARMA/SARMA models (with or without exogenous variables) with correct degree or order of differencing. True or False? Discuss.



greatlearning
Learning for Life

BROAD OVERVIEW

- Check for stationarity before building ARIMA models and pay close attention to the ACF and PACF plots.
- ARIMA models gives us the statistical significance of each Auto-Regressive terms, Moving Average Terms and the exogenous variable terms, if any.

Industry Application – Predicting Arrhythmia with Time Series

Time Series Forecasting procedures are nowadays often used to predict irregularities in the beating of the heart. An ECG (ElectroCardioGram) records the electrical activity of the heart and this output can be used to forecast heart problems in the future with the help of sophisticated Time Series Forecasting tools.

As we have seen, there are a lot of applications of Time Series Analysis and Time Series Forecasting in various fields.

An example of such is given: ECG Anomaly Detection via Time Series Analysis.

greatlearning
Learning for Life

Understanding the Models: To Explain or To Predict?

- In an analytics professional's journey a very vital or important question is whether you are looking to explain the dependent variable or you are looking to predict the dependent variable with maximum accuracy or least error.
- There are various models which might be considered a black-box but helps you predict your target variable with maximum accuracy or least error.
- On the other hand, there are models which does not predict the dependent variable with maximum accuracy (or minimum error) but gives you an idea about the causation of the dependent variable with respect to the independent variable.

Note: Please refer to this lecture by Galit Schmueli to get an understanding of this particular concept.

greatlearning
Learning for Life

CASE STUDY- Predicting the Car accidents in the UK.

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 ARIMA models on the data and choose the most optimum model.

The data that we have ranges from 1969 to 1984. Remember, in the year of 1983 a law was passed in the UK where it was mandatory to wear seatbelts. We will try to predict the number of car accidents per month and we will analyse the data to see whether car accidents actually decreased in the UK after this law was passed.

greatlearning
Learning for Life

ANY QUESTIONS

greatlearning
Learning for Life

HAPPY LEARNING