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# TIME SERIES FORECASTING: Week 1

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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-1/4)

## DOMAIN APPLICATIONS

- Finance and Risk Analytics
- Marketing and 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

- Time Series Analysis – A descriptive view of Time Series
- Exploratory Data Analysis for Time Series data

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# TRY ANSWERING THE FOLLOWING

- If the Time Series data has missing values, we are allowed to drop those data points from our analysis. – True or False? Discuss.

- The residuals in a decomposition of a Time Series gives us the idiosyncratic part of the series which is not picked up by the Trend and Seasonality. – True or False?

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# Industry Application – Predicting Stock Prices

Time Series Forecasting procedures are used to predict stock prices or sales. Till now we have seen how to predict sales using cross-sectional data but not Time Series.

The following is the stock price data of Tesla from the year of 2017. Sophisticated Time Series Forecasting models are used to predict stock prices.* We can also attempt to describe the this particular Time Series using the methods learnt in this week's video lectures.

| date | close | volume | open | high | low |
|---|---|---|---|---|---|
| 2017/11/17 | 315.0500 | 13720830.0000 | 325.6700 | 326.6700 | 313.1500 |
| 2017/11/16 | 312.5000 | 5794409.0000 | 313.9900 | 318.1400 | 311.3000 |
| 2017/11/15 | 311.3000 | 5951835.0000 | 306.0100 | 312.4900 | 301.5000 |
| 2017/11/14 | 308.7000 | 5661904.0000 | 315.0000 | 316.3500 | 306.9000 |
| 2017/11/13 | 315.4000 | 7565242.0000 | 300.1300 | 316.8000 | 299.1100 |

Data Taken from Yahoo Finance

* We will also look at using Time Series as a forecasting tool in the upcoming weeks.

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# CASE STUDY- Analysing Beer Production in Australia

“Prediction is difficult, especially about the future.”

Keeping the above statement in mind, we will analyse the data and try to understand the production of Beer across various years in Australia. We will use the descriptive statistics measures to do so. We will also do a plot of the Time Series, decompose the Time Series data and try to understand how beer production has changed over the past years.

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# ANY QUESTIONS

# Data Science @ Work

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Apply **Data Science at your workplace** to gain some instant benefits:

- Get noticed by your management with your outstanding analysis backed by data science.
- Create an impact in your organization by taking up small projects/initiatives to solve critical issues using data science.
- Network with members from the data science vertical of your organization and seek opportunities to contribute in small projects.
- Share your success stories with us and the world to position yourself as a subject matter expert in data science.

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# HAPPY LEARNING