Time Series Analysis with R

Predicting the future is a tough problem. Time series analysis makes it possible to assess whether or not predictions are possible and, if they are, build a model which can generate informed predictions for the future with realistic estimates of uncertainty. This training course will introduce participants to the packages in the Tidyverts. > The best qualification of a prophet is to have a good memory – **George Savile**

Course Outline

- Introduction to tsibbles: Using the {tsibble} package to manipulate time series data
- Features and Visualisation: Creating seasonal, lag and autocorrelation plots using the {feasts} package
- STL Decomposition: De-constructing a time series into it's seasonal and trend components
- Introduction to forecasting: Constructing simple forecasts with the {fable} package
- Exponential Smoothing: Creating and forecasting with ETS models
- ARIMA models: Creating ARIMA models and forecasting

Learning Outcomes

Session 1:

By the end of session 1 participants will…

- have an understanding of what time series are and be able to store time series data in R using {tsibble}.
- know how to visualise time series data using {feast} and {ggplot2} for seasonal plots, subseries plots, lag plots and autocorrelation.
- gain knowledge of time series decomposition and be able to fit and models using STL decomposition and plot the components. - have the ability to choose STL model parameters and be able to acquire seasonally adjusted series.

Session 2:

By the end of session 2 participants will…

- be familiar with different forecasting methods.
- be able to use the {fable} to create forecasts and {feasts} visualise them.
- know how to extract prediction intervals from a forecast, get the residual forecast plots and determine accuracy of a forecast.
- have an understanding of exponential smoothing for modelling time series.
- be able to apply SES models.
- have an understanding of ARIMA models and have the ability to fit, forecast and visualise both non-seasonal and seasonal ARIMA models.

This course does not include:

- an in-depth discussion of the statistical principles behind the forecasting methods covered.
- regression-based models - see our Tidymodels course instead.
- spectral methods.

Attendee Feedback

- "Very beneficial course helped by insightful and clear explanations from the trainer."
- "This is my second course with Rhian and she is a great and clear instructor. She is engaging, even virtually, and I find the structure of the course very helpful for learning. Short lecture, followed by a demo, followed by a practical and then coming together to discuss is a great way to make the material stick. Thank you Rhian!"