# Forecasting: principles and practice

Lab Session 12 25 September 2014

Before doing any exercises in R, load the **fpp** package using `library(fpp)`.

1. Use the `tbats` function to model the `visitors` time series.
   (a) Check the residuals and produce forecasts.
   (b) Does this completely automated approach work for these data?
   (c) Have you saved any degrees of freedom by using Fourier terms rather than seasonal differencing?

2. The following code will read weekly data on US finished motor gasoline products supplied (thousands of barrels per day):

   ```
   gas <- read.csv("http://robjhyndman.com/data/gasoline.csv")[,1]
   gas <- ts(gas, start=1991+31/365.25, frequency = 365.25/7)
   ```

   (a) Fit a `tbats` model to these data.
   (b) Check the residuals and produce forecasts.
   (c) Could you model these data using any of the other methods we have considered in this course?

3. Experiment with using `nnetar()` on some of the data considered in previous lab sessions.

4. Over this course, you have developed several models for the retail data. The last exercise is to use cross-validation to objectively compare the models you have developed. Compute cross-validated MAE values for each of the time series models you have considered. It will take some time to run, so perhaps leave it running overnight and check the results the next morning.

***Congratulations on finishing the forecasting course! I hope you have learned things that will be useful in forecasting whatever it is you want to forecast.***