

## Time Series and Forecasting (ST304) 2009/2010

### Exercises 1

Please hand in your answers to Questions 4, 5, 6 by Wednesday 20th January 2010, 5pm. Leave your solutions in Box 2 (Miss Haeran Cho), on the left-hand side on the ground floor in Columbia House. Late solutions will not be accepted.

1. “R” is a free, modern, easy to use, fast and extensive programming environment for statistics, including (but not limited to) time series analysis. Check if your machine has R installed on it. If not, download and install it from

<http://www.r-project.org/>

2. Explore the following tutorial on R -

<http://www.maths.bris.ac.uk/~mapjg/R/tutorial.pdf>

3. Run R and have a play with it. If you feel you need more help, go to Help -> Manuals (in PDF) -> An Introduction to R.

4. Find an interesting time series dataset on the web, import it into R and plot it. Here are some tips:

- Depending on your interests, you may want to look for data on the following websites:

<http://www.federalreserve.gov/releases/h10/Hist>

<http://www.gapminder.org>

<http://www.metoffice.gov.uk/climate/uk/stationdata/index.html>

<http://www.oanda.com/convert/fxhistory>

<http://uk.finance.yahoo.com/m2>

However, try not to limit yourself to the above sites.

- To import, or “scan” a dataset (e.g. a time series) into R, use the `scan` command. Type `help(scan)` in R to find out how to use it. Your data must be saved in a suitable text format.
  - To plot a scanned time series in R, use the command `ts.plot`. Again, use the `help` command to find out more about `ts.plot`.
5. Based on your plot, discuss the most obvious visual features of the time series you have plotted. Is it easy/possible to explain what might have caused them?
  6. Compute the sample autocorrelation sequence of your time series, using the R command `acf` (which stands for “autocorrelation function”). Try to comment on the shape of the acs.