MAS6011 Time Series Project
Analysis of Daily Temperatures in Melbourne

A time series data set consisting of daily maximum temperatures (^{0}C) in Melbourne can be found in the file `TempMelb`[1]. The data set covers a period of 1 January 1981 to 31 December 1990 and it is kindly provided for educational use by the Time Series Data Library and the data provider DataMarket (`DataMarket.com`).

Write a report on the data, concentrating on (a) describing their structure and (b) discussing time series modelling and forecasting. The report will account for 15% of the overall assessment of this module. For the deadline of submission, consult the Course work schedule.

Some comments/suggestions and notes on organisational matters follow (however, note that they are not mandatory). There is no page limit for the report.

Comments and suggestions

1. A Box-Jenkins approach to part (a) of the question would use differencing to ensure stationarity. Model diagnostics can be used to ensure that the model fit is acceptable. However, it has to be recognised that differencing has limitations. You will find that differencing for a very long seasonal cycle does not work in R. You will have to deal with this issue in the project.

2. In the light of (1), a direct approach of modelling, which does not need to rely on the differencing process, could be the use of an appropriate state space model.

3. To address forecasting you may decide to provide forecasts for time-points in the end of the series. Another approach could be to split the data in parts and forecast already known values pretending they were not available to you initially.

Notes on Procedures and your Report

1. This is an assessed piece of work, so answers to questions about it must be available to everyone equally. Any questions should therefore be posted on the discussion board.

[1] On the course web page MAS6011 Semester 2 MSc Project MOLE web page

2. Distance Learners have not yet had the benefit of participating in MAS6001, so the criteria that are laid down for reports in MAS6001 will not be applied here. In particular, there will be no explicit consideration of presentation issues in the assessment. Of course, what you present has to be intelligible, otherwise I cannot mark it.

3. There is no page limit, but you need to use the space wisely. Very short reports are not likely to cover the ground (especially with a few plots) and very long reports are likely to be repetitive.

4. The body of the report should be in connected English, illustrated if appropriate by suitable plots (though plots should appear only if they are relevant to the argument and only if they are referred to explicitly in the body of the report). The main body of the report should not contain non-graphical software (e.g. R) output or jargon; you may put *annotated* software output in appendices if you think it is important to have it on record.

5. You should write the report as thought for an intelligent and statistically-trained reader (another MSc student for example) who knows the general technical background of time series, but has not met these data before, nor the software you use.

6. The report should be self-contained; it should not call for calculations or clairvoyance on the part of the reader.

7. The report should be written so that the reader does not need to look at appendices unless he/she wants to check something you have done.