Queen Mary University of London

School of Mathematical Sciences

MTH6139 TIME SERIES **Practical 6**

(14 December 2011, 10.00 - 12.00, FB 3.44)

NOTE:
*You should **not** hand in your solutions for marking, but you are welcome to discuss them with me during my office hours.*

6.1 ARIMA Models

6.1.1 Length of the Thermal Growing Season Data

The growing season is the period of time each year during which plants can grow. The thermal growing season length is defined as beginning when the temperature on five consecutive days exceeds 5°C and ending when the temperature on five consecutive days is below that threshold.

The yearly lengths of the thermal growing season in England from 1772 to 2006 are given on the course webpage in the data file **GrowingSeason.mtw**.

Fit the best model to the data and predict observations for the next five years. Note that it may be better to consider only a part of the data, such as the last 60 or so years.

Source: http://www.decc.gov.uk/en/content/cms/statistics/climate_change/climate_change.aspx.

6.1.2 Paleoclimatic Glacial Varve Data

A varve is defined as a layer or a series of layers of sediment deposited annually in a still body of water, for example, by a glacier. Varves can be counted back to date a specific layer.

The yearly glacial varve thickness data were collected from one location in Massachusetts for 634 years, beginning 11,834 years ago. The data are given on the course webpage in the data file **Varves.mtw**.

Fit an ARIMA(p,d,q) model to the data and predict five more values of the valve thickness.

Source: Shumway, R.H. and Stoffer, D.S. (2006). *Time Series Analysis and its Applications: With R Examples*, 2nd edition. Springer.