APM Assignment 2 2020-21

Forecasting COVID-19 hospitalisations

One of the concerns of governments around the world during the COVID-19 pandemic is pressure on health systems. The aim of this assignment is to develop models for forecasting the number of daily COVID-19 admissions in hospitals in the UK and summarise your findings in a short report (max. 10 pages).

Data

In the UK, hospital admissions data is published every day and is available from https://coronavirus.data.gov.uk/details/healthcare. You can download the hospital admissions data for the entire UK or for one of the four nations (England, Scotland, Wales, Northern Ireland).

Tasks

1. Describe the dataset you will be working with. Produce appropriate plots to explore the temporal pattern of the number of admissions.
2. Develop a 'best-fitting' ARIMA model for the data up to a certain date, leaving the most recent two weeks' worth of data as a test set for forecasting (see Task 3 below). Explain why you have chosen this model, and discuss how well it fits the data.
3. Use your ARIMA model and one other model out of those discussed in the course to forecast the number of daily hospital admissions for the two weeks in your test data. Provide confidence intervals for your forecasts and display both the forecast and confidence interval in a plot.
4. Evaluate the forecasting performance of your models for the test data using RMSE (or similar) and coverage probability.
5. Briefly describe the limitations (if any) of your approach and suggest potential improvements that might be made to the model/data collected in order to better forecast the number of admissions for a short period ahead.