W271-2 – Spring 2016 – **HW 4**

Juanjo Carin, Kevin Davis, Ashley Levato, Minghu Song

February 24, 2016

Contents

Exercises

Question 1

1. Install the library "astsa" using the function: install.packages("astsa")

2. Load the library: library(astsa)

3. Use the function str() to see the information of a particular data series, such as str(EQ5) for the Seismic Trace of Earthquake number 5 series.

4. Plot the time series plots and histograms of the following 3 series. Feel free to use the codes provided in the R scripts. Make sure that each of your graph has a title, the axis ticks are clear, the axes are well-labelled, and use color intelligently.

5. Write a few sentences to describe each of the series. *EQ5* flue *gas

---

Question 2

Describe 3 examples you have used in your work or encounter in real life. Ideally, you can even load at least one of these time series, plot it, and the write a few statements to describe its characteristics.

Question 3

Simulate a white noise series with 1000 random draws and plot (1) a time series plot and (2) a histogram. The usual reqirements on graphics (described) in Question 1) applied.

Question 4

Simulate (with 1000 random draws) two the following two zero-mean autoregressive model with order 1 (i.e. AR(1)) models:

$$yt = 0.9y_{t1} + w$$

$$y_t = 0.2y_{t1} + w$$

Plot a time plot for each of the simulated series. Graph a histogram for each of thes simulated series. Write a few statements to compare the two series.

Question 5

Simulate (with 1000 random draws) the following 3 models:

1. A deterministic linear (time) trend of the form: yt = 10 + 0:5t

2. Random walk without drift

3. Random walk with drift = 0.5

Plot a time plot for each of the simulated series. Graph a histogram for each of thes simulated series. Write a few statements to compare the two series.
