Assignment 3

STAT317/ECON323

Due 5pm Monday, 4 October 2021

A reminder that graphs help in interpretation and explanation and you are expected to present them properly.

1 Question 1 — 11 Marks

For assignment 3 I have supplied a text file (rainfall.dat). This has the hourly rainfall data at Christchurch for .

a Get the data from the text file into an R time series object.

b Since most of the time the hourly rainfall is zero (0) this are not in the file. Create a complete time series with all 8,784 hours in the year. That is, add the hours with zero rainfall. Plot this series. Also what percentage of the hours have zero rainfall?

c Produce an ACF plot for this series. What does this tell you about rainfall?

d From the hourly data create a time series of daily data

e Produce an ACF plot for the daily rainfall series? Comparing it with previous ACF how similar or dissimilar are they? Explain your result?

2 Question 2 – 9 marks

For this question use the time series you selected for the previous assignments. Use the data from the years 2000-2019 only i.e. suppress COVID effects. It is recommended you use the HoltWinters option in the forecast package.

a Fit the following models to your data using the following methods:

(a) Single exponential smoothing

(b) Exponential Smoothing with trend

(c) Exponential Smoothing with trend and seasonal component

(d) The previous model but applied to a log transformed series;

Fo s the time series of the residuals what you would ex series model fit? Also from the residuals, which do model? Explain your reasoning.

b Fo e the values of for α, β, γ? What does this tell yo for measured recent data compared to that for est