ECO 5375-701 Prof. Tom Fomby

Eco and Bus Forecasting Fall 2021

**EXERCISE 5**

**Purpose:** To learn how to use the exponential ses, holt, and hw functions to estimate various exponential smoothing models and, using an out-of-sample forecasting experiment, comparing the competing models’ forecasting accuracies on a test data set. This exercise is due **Tuesday, September 21 at 6:30 pm CST. Submit your work on Canvas.**

Following the lead of the programs “Several Expos Demo Plano Data.R nad ETS Demo Plano Data.R, use the the Hawaiian data set **Hawaii.csv** to fill in the following table. Create the training data set, say, hawaii1, and test data set, say, hawaii2. Reserve the first 25 years of data for the training data set (1970:1 – 1994:12) and the last **12** observations for the test data set (1995:1 – 1995:12).

(a) Test Data

Method RMSE MAE MAPE

Simple Expo (ses)

Holt Linear Trend

(holt)

Holt Linear Trend

(damped)

Holt-Winters’ (hw)

Additive Seasonal

Holt-Winters’

Additive Seasonal

(damped)

Holt-Winters’

Multiplicative Seasonal

Holt-Winters’

Multiplicative Seasonal

(damped)

ETS(ZZZ)

Airline Model

(b) Which model performed the best? Using the autoplot command, report the plot of the forecasts of your best model here.

(c) **Report here the R code you used to complete this exercise.**