## Exercise 4 – User Defined Holidays with Genhol

## Create an Easter Monday regressor

Start R and load the seasonal library.

Run **data(holiday)** to load a date vector **easter** containing the dates of Easter from 1931 to 2030.

Create an Easter Monday regressor called emon for a monthly series. The holiday runs from one day after to one day after Easter, and is calendar-centered.

## Use the Easter Monday regressor in an X-13 run

Import the data series c:\x13\data\mx\Services output (IGAE tertiary sector).dat and call the time series object ts.ser.

Run the seasonal object

ser.m1 <- seas(ts.ser,transform.function=”log”,arima.model=”(1 1 0)(0 1 1)”,regression.aictest=NULL, regression.variables=c(“tdnolpyear”,”lpyear”,”easter[3]”,”LS1995.Feb”,”LS1995.Apr”,”LS2000.Jan”, ”LS2008.Dec”,”TC2009.Apr”),outlier.types=”all”)

Add the commands to include the emon regressor. Run the new seasonal object as ser.m2.

Is Easter Monday significant? Yes, t = -2.25

Compare the AICC of the models with and without Easter Monday. The AICC is 573.1 without Easter Monday and 570.5 with it.

Change the seasonal object so the model span starts in 2008. Is Easter Monday significant? No, t = -1.65.