Group Project Guidelines – Time series

Objectives

The project involves Box-Jenkins methodology to forecast airport traffic time series.

Your data set

You have to download monthly data of air traffic from a specific airport. The series should contain about 100 observations.

You can find air traffic data sets from many online sources from a google search. Below is a list of a few sites:

- http://www.parisaeroport.fr/groupe/finances/relations-investisseurs/trafic to extract traffic data from an airport of Paris.
- https://bitre.gov.au/publications/ongoing/airport_traffic_data.aspx to extract data from 20 Australian airports
- https://www.transtats.bts.gov/Data_Elements.aspx?Data=1 to extract data from American airports
- From the website: http://www.airportwatch.org.uk/uk-airports/, you can download data from different European airports (example http://www.airportwatch.org.uk/uk-airports/gatwick-airport-2/gatwick-passenger-numbers/)
- Website of the European Union : www.ec.europa.eu

Organization

This is a group effort. You should organize and submit your work as a group.

Presentation

You have to upload a zip file named name1-name2.zip (ex : GALY-VANHEMS.zip) with :

- your R project (data sets and script) file
- your ppt presentation summarizing and interpreting the results.

Your presentation should contain tables and graphs useful for your analysis as well as comments for each of them. More precisely, you should develop the following items:

- Description of the time series (/2)
- Stationarity: Is your series stationary? Include graphs and tables to justify your analysis (acf, pacf, graph of the series). Explain how you transformed the data in order to reach stationarity (log transformation, differentiation with different orders). (/5)
- Box-Jenkins methodology to build an ARMA process on the stationary data. (/10)
  i. Identify the orders p and q using the ACF and PACF. (/2)
  ii. Comment the significance of the coefficients. If necessary, modify the model until all the coefficients are significant. (/3)
  iii. Residual diagnostic: check for the normality, the non autocorrelation assumption and the homoscedasticity of the residuals. (/4)
  iv. Comment the information criteria values (AIC, SBC) to select the best model. (/1)
- Model validation with an in-sample and out-of-sample analysis and a forecast for the next three periods. (/3)