

National University of Singapore  
ST3233: Applied Time Series

## Assignment 2

Semester 1: 2016-2017

1. Please, write your group number as well as the matriculation number and name of each member of the group.
2. The assignment is to be uploaded on the IVLE by the **30th of October**, 11:59pm.
3. Late assignment will not be accepted. Only typed **pdf** files can be submitted.
4. if your group number is XX, please name your file:

`assignment_2_XX.pdf`

For example, if you are submitting a report for the group 13, your file should be named

`assignment_2_13.pdf`

## Exercise 1 (Can one trust confidence intervals?) [Pts = 20]

Consider the `birth` time series in the file `tsa3.rda`.

- Fit an SARIMA model to it.
- Use your model to get a 80% confidence interval for the number of births in February 1979.
- Use an approach similar to cross validation to estimate whether or not you can trust this 80% confidence interval.

## Exercise 2 (Number of Births in California?) [Pts = 20]

Consider the time series contained in the file `daily-total-female-births-in-cal.csv`; this describes the daily number of birth in California during the year 1959. Use the methodology of your choice to forecast the number of births during the two weeks following the data collection. Justify your answer!

## Exercise 3 (How much beer?) [Pts = 20]

Consider the time series contained in the file `quarterly-beer-production-in-aus.csv`; this describes the quarterly consumption of beer in Austria. Use the methodology of your choice to forecast the quarterly consumption of beer during the whole year following the data collection. Justify your answer!

## Exercise 4 (Temperature in Singapore?) [Pts = 20]

Consider the time series contained in the file `temperature_in_singapore.csv`. Use the methodology of your choice to forecast the temperature in Singapore during the next two years following the data collection. Justify your answer!

## Exercise 5 (Monthly Car Sales in Quebec?) [Pts = 20]

Consider the time series contained in the file `monthly-car-sales-in-quebec-1960.csv`. Use the methodology of your choice to forecast the number of car sales during the next two years following the data collection. Justify your answer!

**Remark:** before using any statistical method, it is usually a good idea to spend some time to explore your data. Do not hesitate to compare several models, to try to transform your data if appropriate, to visualize your forecast to detect absurd predictions, etc...