



EXERCISES SESSION 6

The purposes of this lab are the following:

- Improve the model specification with alternative-specific coefficients by adding some non-linearities in the deterministic part of the utility function
- Test models whose hypothesis are non-nested
- Improve the resulting MNL model by applying a socio-economic segmentation

In all cases you will work with the *Airline Itinerary Choice* dataset. You will also learn how to test non-nested hypothesis.

Question 1

Using the model files provided, estimate models with different non-linearities (piecewise linear, power series, Box-Cox, logarithm). What is the interpretation of the parameters obtained in each case? Use a likelihood ratio test to test each of them against a model with a linear specification. Can you use a likelihood ratio test to decide between models with different non-linearities?

Question 2

Using the files provided, perform a Cox-test between a model where the fare is considered linear and one where the fare is considered logarithmic. Use the same test to compare two of the models with different non-linearities from Question 1.

Question 3

Consider the best model that you obtained at the end of Question 2 and perform the following tasks:

1. Try a socio-economic segmentation of the constant, which is equivalent to adding socio-economic parameters directly to the utilities. Is this segmentation significant?
2. Try a socio-economic segmentation of attributes of the alternatives one-by-one. Remember the difference between discrete and continuous segmentations. Are your segmentations significant?
3. Try a socio-economic segmentation of all parameters. How can you test if this segmentation is significant? Is a socio-economic segmentation of all parameters relevant?
4. Improve the model that you developed during the exercises session 5 using the results of the segmentations you tried above.