EPFL
ENAC TRANSP-OR
Prof. M. Bierlaire

Mathematical Modeling of Behavior
Fall 2014

Exercises session 9

The topic of this lab is forecasting. You should work on the *Optima* dataset –Mode choice in Switzerland.

1. In the dataset, 943 respondents are men, and 871 are women. In the population of Switzerland, there are 97.3 men for 100 women. How can you compute the predicted market shares in order to handle the oversampling of women in the data?

2. Imagine that the public transportation company (for simplification assume that there is only one big company that owns all public transportation in Switzerland) intends to increase its (real) revenues. How would you proceed to find the public transportation costs which maximize the public transportation revenues? Find the optimal costs.
   Hint: For simplification you can consider either a global increase or decrease of public transportation costs in terms of percentage of the current rail costs.

3. While computing the market shares, the estimated parameters of the model are used. How standard errors of parameters can affect the predicted market shares?

On the website, we provide a final model for the dataset *Transportation mode choice in the Netherlands* and some results are presented in the file *summary_forecasting.xls*. These results can help you find inspiration, in particular for question 2, but you are asked to work on the *Optima* dataset.

Your second assignment:

In a 2-page report:

- give the current market shares for each of the three modes;
- present the effect of changes in one attribute, e.g. cost, on the market shares;
- present your strategy to deal with the oversampling of men; and
- show the optimal cost for public transport.

This is a group work. Groups are the same than for previous assignment. Note that this assignment is **compulsory** and has to be given in by **Friday 21st November**.

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