EPFL
ENAC TRANSP-OR
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Mathematical Modeling of Behavior
Fall 2020

LAB SESSION 8

In lab sessions 7 and 8, you will work with the same topic *Validation and forecasting*. In these sessions, you will work with one of the specifications for the *Netherlands mode choice* case study developed in previous labs and you will perform different tasks related to the validation of the model and the forecasting and calculation of relevant indicators. The purposes of lab sessions 7 and 8 are the following:

- perform an outlier analysis using the simulation file from Biogeme to generate the probabilities and any statistical software for the analysis,
- compute relevant indicators to better understand the behavior of the population, and
- evaluate different hypothetical scenarios,

This lab session 8 continues the tasks of the previous lab session. First, download the file `Netherlands_Val_For_2.zip` on Moodle. It contains:

1. the **data** file `netherlandsRP_w.dat` including the individual weights computed in the previous lab (aggregation)
2. the **documentation** `Calculating indicators with PandasBiogeme`, with instructions to use the simulation features of Biogeme. This document is also available on the Biogeme website.

Then, you will work on the following tasks.

Indicators
Use the simulation file prepared in Lab 7 to compute the following indicators:

1. Value of time:
   (a) Provide an estimate of the average value of time in the population in eur/h for each alternative.
   (b) Analyze the distribution of the value of time for each alternative in the sample by identifying the socioeconomic characteristic(s) that play(s) a role in the calculation of the value of time and report its value together with the 90% confidence interval.
2. Aggregate elasticities
   (a) Elasticity of the share of car with respect to travel time by car
   (b) Elasticity of the share of car with respect to the cost of car

(c) Elasticity of the share of rail with respect to travel time by rail

(d) Elasticity of the share of rail with respect to the cost of rail

(e) Elasticity of the share of car with respect to travel time by rail

(f) Elasticity of the share of car with respect to the cost of rail

(g) Elasticity of the share of rail with respect to travel time by car

(h) Elasticity of the share of rail with respect to the cost of car

Forecasting

For this part of the lab, we ask you to compute the predicted market shares for an increase of the cost of rail of 10%.

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