EPFL
ENAC TRANSP-OR
Prof. M. Bierlaire

Mathematical Modeling of Behavior
Fall 2020

COMPUTER SESSION 3

The goal of this computer session is to (i) become familiar with the Python syntax in Biogeme and (ii) estimate and interpret a binary logit model. In order to achieve this goal you will specify and estimate various mode choice models for the Netherlands case study.

First, download the files from the folder *Case Study Lab 3*. It contains:

1. the `binary_generic_netherlands.ipynb` jupyter notebook file with an example model specification:
   - it is a binary logit model with car and rail as the two choices, and
   - this is your base model, and you will use it as a template to perform more modeling exercises;
   - note, the file `binary_generic_netherlands.py` is also included if you would prefer to use a python text editor instead of Jupyter notebooks - it has the same content as the `ipynb` file (these instructions assume you will use the `ipynb` notebook);
2. the description and interpretation of the base model, as well as some extensions of it that we propose (`03Lab2020_solution.pdf`);

Now, make a copy of the `binary_generic_netherlands.ipynb` notebook, and open it in Jupyter. Use it as a template to perform the following tasks:

1. Follow the description in the `03Lab2020_solution.pdf` file and for each model described there:
   - Try to understand the proposed specification.
   - Try to code the proposed specification. You should create the following files:
     (a) `binary_specific_netherlands.ipynb`
     (b) `binary_socioec_netherlands.ipynb`
   - Estimate the model specifications. You should obtain the following files:
     (a) `binary_specific_netherlands.html`

(b) `binary_socioec_netherlands.html`

- In order to verify that your code is correct, compare the results that you obtain with the ones that we provide in the solution file.

2. Develop new model specifications using your own hypotheses. Estimate these models and interpret the obtained results. Compare with the proposed models to see if there is any improvement in the performance of the model.

Remarks and hints:

- You will find the Netherlands dataset and its description in: http://biogeme.epfl.ch/data.html

---

mpp / th / rk / no / jp / mw