Optimization and Analytics

Bachelor in Data Science and Engineering

Second Homework: Network Optimization and Non-linear Models (Topics 2, 3)

Deadline: December 17, 2023 at 23:00
Upload to Aula Global: notebook (including html) and any data used

General Objective

Build and solve two realistic problems:

1. Network optimization: one optimization model with discrete variables and a network structure
   You can get inspiration from the models in this book:
   Network Optimization: Continuous and Discrete Models
   where you can re-adapt a model using your own data to add originality

2. Non-linear optimization: one model with a non-linear objective and at least one non-trivial constraint (linear or non-linear)

The bigger and more complex the problems, the better

Evaluation

a) (*5 points*) Formulate the network optimization problem as a discrete model (Topic 2), identifying mathematically the variables and constraints associated with the network. Solve and interpret the solution.

b) (*5 points*) Formulate (mathematically) and solve a non-linear optimization problem based on real (or realistic) world data. Interpret the solution.

Remember the deadline: December 17, 2023 at 23:00

IMPORTANT: Present the code in a Jupyter notebook and name it as "Surname-Name-HW2.ipynb". Upload also the corresponding complied version "Surname-Name-HW2.html", and the datasets that are needed (if any) to reproduce your results.