

Scoring

Course title – Intitulé du cours	Scoring
Level / Semester – Niveau / semestre	M2 / first semester
School – Composante	Ecole d'Economie de Toulouse
Teacher – Enseignant responsable	Louis Olive
Other teacher(s) – Autre(s) enseignant(s)	Arthur Mello
Other teacher(s) – Autre(s) enseignant(s)	
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Lecture Hours – Volume Horaire CM	36 (Part 1 9H; Part 2 15H; Part 3 12H)
TA Hours – Volume horaire TD	
TP Hours – Volume horaire TP	
Course Language – Langue du cours	English / Anglais
TA and/or TP Language – Langue des TD et/ou TP	English / Anglais

Teaching staff contacts – Coordonnées de l'équipe pédagogique :

1. Louis Olive: louis.olive@gmail.com
Preferred means of interaction: email
2. Arthur Mello arthur_bmello@hotmail.com
Preferred means of interaction: email

Course Objectives – Objectifs du cours :

Part 1 Methods (L. Olive) Statistical learning goals and vocabulary are defined in the context of scoring and classification. Introduction and study of two workhorses: the logistic regression model and decision trees. The emphasis is put on numerical examples with a hands on approach. Codes are given in R.

Part 2 Credit risk applications (L. Olive) Credit risk is one of the various application of scoring. Presentation of a concrete case using a real life data set. Presentation of a baseline solution. A selection of topics will be proposed to the students with the goal to improve this baseline and assess alternative methods. Realization of a project per group of students including:

- the reading of selected papers,
- the exploration of additional data sets,
- the understanding of the methods or algorithms at stake (if necessary the student will re-implement from scratch a simplified version or give a short proof of key results),
- the implementation of the methods on the real life data set,
- the assessment of the solution,
- the writing of a report and a presentation.

Part 3 Marketing applications (A. Mello) Marketing is another important area of application for scoring. Presentation of marketing use cases for scoring: churn prediction, customer propensity to use

a service, etc. Practical application with a project covering the entire data workflow using Python: data cleaning, feature engineering, modelling, data visualization, and presentation.

Prerequisites – Pré requis :

Basic knowledge about linear regression and maximum likelihood. Practice of R and Python softwares.

Practical information about the sessions – Modalités pratiques de gestion du cours :

Personal computers allowed. The course attendance is compulsory

Grading system – Modalités d'évaluation:

Part 1. 1 hour in-class data analysis on a real dataset including data exploration plus roadmap proposal, followed by a take-home assignment implementing the roadmap (report + R code).

Part 2. Project per group of students. No late project accepted.

Part 3. Project per group of students - Bonus for participation. No late project accepted.

The final grade is the average mark of the three parts.

Bibliography/references – Bibliographie/références :

Hosmer D.W., Lemeshow S. and Sturdivant R.X. (2013) Applied Logistic Regression, Wiley.

Cornillon P.A., Matzner-Løber E. (2019) Régression avec R, Springer.

Hastie T., Tibshirani R. and Friedman. J. (2009) The Elements of Statistical Learning: Data Mining, Inference and Prediction, Springer.

(https://hastie.su.domains/ElemStatLearn/printings/ESLII_print12_toc.pdf)

Session planning – Planification des séances :

Part 1 cf. Moodle site

Part 2 cf. Moodle site

Part 3

Day	Duration	From	To
Wednesday 22/11/2023	03h00	09h30	12h30
Wednesday 22/11/2023	03h00	15h30	18h30

Thursday 23/11/2023	03h00	09h30	12h30
Thursday 23/11/2023	03h00	14h00	17h00

Distance learning – Enseignement à distance :

Distance learning can be provided when necessary by implementing, for example: / En cas de nécessité, un enseignement à distance sera assuré en mobilisant, par exemple :

- Interactive virtual classrooms / Classe en ligne interactive
- MCQ tests and other online exercises and assignments / QCM et exercices en ligne
- Remote (online) tutorials (classes) / TP/TD à distance
- Chatrooms / Forums