OIK812 Computational Economics

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Syllabus

Introduction to modeling and simulation in economics. Programming applications with Cpp/R/Octave/Maxima, etc. The course requires familiarization with at least one programming environment. Good knowledge of basic statistics is highly recommended. Topics to be covered:[1]

- Meaning of model, what is a model and why to use models in economics.

- Random numbers and their use, Monte Carlo simulation.[2]

- Markov chains, Markov chain Monte Carlo.

- Modeling of dynamic systems with difference equations and differential equations.

- Numerical methods for differential equations.

- Model optimization with or without constraints, computational methods for global optimization.

- Empirical models in economic research.

- Simulation of time series models, autocorrelation, heteroscedasticity, cointegration, etc.

- Introduction to agent-based models and simulation.

- Simulation of queue systems, applications to production chains.

Teaching

Lab work and meetings combined time, 4 hours per week, every Monday 4-8 pm.

Grading policy

A final assignment (presented and defended) for 70% of the grade. Participation in labs and 1-2 sort lab tests for the other 30%. All writings and essays are required in Latex.

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[1] Not all topics are covered each semester. Selection of topics might apply, depending on students and instructor's interests.

[2] Writing a program to celebrate the π day (3.14, `https://en.wikipedia.org/wiki/Pi_Day`) is highly desirable.