Project 2: Model Analysis Project

Vision: Programming is more than writing code. The ultimate goal of the projects in this course is that you learn to formulate a programming problem of your own choice, and find your own way to solve it, and present the results. The bullets below are minimum requirements, but otherwise it is very much up to you, what you will like to do with your project. You can use pretty much any economic model that you have encountered during your studies. It is not a bad idea to do further work on a model you already have a good understanding of from a course, seminar or bachelor thesis.

Note: If you departure point is a model presented in the lectures (e.g. AS-AD) or in the problem sets (e.g. the Solow model), the requirement for passing is higher than if you start from scratch.

- **Objectives:** In your model analysis project, you should show that you can:
  1. Apply numerical model analysis methods such as optimization and equation solving.
  2. Structure a code project.
  3. Document code.
  4. Present results in text form and in figures (put text in Markdown cells).
- **Content:** In your model analysis project, you should at a minimum:
  1. Describe an algorithm on how to solve your economic model
  2. Solve the model using an optimization routine or an equation solver and simulate it.
  3. Visualize how the solution changes across parametrizations. This is an important task (that also works as a debugging device).
  4. Analyze one or more extensions of the baseline model.
- **Limitation:** *sympy* can only play a very small role in your project because the focus must be on the *numerical* solution.
- **Structure:** Your model analysis project should consist of:
  1. A README.md with a short introduction to your project
  2. A single self-contained notebook (.ipynb) presenting the analysis
  3. Fully documented Python files (.py)

  Example of structure: See this repository.
- **Size:** *Quality before quantity.* It is better to have a rather simple but well-tested model with nice vizualization and simulation compared to a larger model that does not succeed entirely.
- **Hand-in:** On GitHub by uploading it to the folder:

  github.com/projects-YEAR-YOURGROUPNAME/modelproject/
- **Deadline:** See Calendar.

- **Exam:** Your model analysis project will be a part of your exam portfolio.
  You can incorporate feedback before handing in the final version.
- **Peer feedback:** After handing in, you will be asked to give peer feedback on the projects of two other groups.
- **General advice:** In the beginning of the project, write your code in the way *you* find most intuitive. Also if that is a slow implementation, which does not use optimized routines and such. You can then begin to optimize it when things seem to work the way you intend.
- **Advice for choosing a model:** You should preferably choose a model you are already familiar with, and you should definitely choose a model you find interesting. Think back to courses you have taken or are currently taking, particularly elective courses, a seminar or your bachelor thesis. Which models did you find the most exciting? Maybe there was a model which had an assumption you found unrealistic, which you could change and still be able to solve the model using numerical methods?