

Mathematical Economics: Homework

Alan G. Isaac

December 26, 2024

WARNING: This document is **copyright 2024** by Alan G. Isaac, all rights reserved. Unauthorized sharing of this document is a copyright violation. For students of American University, unauthorized uses of this document are additionally an **Academic Integrity** violation. The only authorized duplication of this document is by my math econ students taking this course in 2024, who may retain one (1) printed copy exclusively for their own personal use.

Collected Assignments [Assignments](#) will be listed below as they are assigned. Each assignment is due before the start of the subsequent class, unless otherwise announced. Each assignment should include a header that lists the homework number, your name, and an acknowledgment of your group members (or anyone else who provided useful help).

Homework submissions must be typed in a Mathematica notebook and submitted in PDF format. (PDF Creation Hint: disable "Dynamic Updating" (Menu/Evaluation/Dynamic Updating Enabled) before printing to PDF.) Make sure you do a Mathematica tutorial before attempting to write up your homework! A single file should contain your answers to all the exercises for a homework. Computational problems should include helpful comments on your Mathematica code.

Homework is individual work, not group work. You may verbally discuss problems with other students, but for the graded problems you **must not look** at their work, and you **must not show** your work to them. **Looking at or sharing work on graded problems is an Academic Integrity Violation that can lead to program dismissal.** Additionally, **submitting the output of an AI as your own work is an academic integrity violation.** In contrast, full collaboration on the optional (ungraded) problems is unrestricted and is encouraged.

Discussion Sections Be sure to read the discussion sections that I provide for the computational problems. In addition to providing hints, they sometimes include details about the problem *requirements*.

Computational Exercises: Some *computational* exercises below could easily be done with a calculator or even by hand. In such cases you need to provide the code, however trivial.

WL Programming The online WL documentation is excellent. E.g., <http://www.wolfram.com/broadcast/video.php?channel=89&video=409>.

Reminder: Assignments are due *before* the next class starts. Turn in a PDF file created from Mathematica. Use the sectioning facilities of Mathematica notebooks: use a separate subsection for each problem. Please pay attention to both the general and the language-specific discussion that I append to many problems. Your filename should combine the homework number and *your* last name: e.g., hw01-Lastname.pdf. (Never use spaces or any additional punctuation in your file names.) Submit this PDF via Blackboard.

A crash upon PDF creation is rare but not unknown. So *first* save your work. Then, after saving your work, try saving it as PDF. You may have better success saving as PDF if you first go to the Evaluation menu and disable Dynamic Updating.

Reminder: The syllabus readings are required. Do the readings *before* attempting the homework. Additionally, be sure to read the hints for each problem.

You must type your homework in Mathematica, but use of Mathematica commands is typically *not* needed for the analytical exercises. (As opposed to the computational exercises.) Be sure that you are working with my Introductory Mathematica Resources (on Canvas). (If you skip the tutorials, you will *of course* work very slowly.) Use the Canvas Discussions to raise questions about the homework or about Mathematica.

Reminder: Course policy **requires** you to use an external back up of your homework files, to guard against computer failure or theft. Common choices are [Google Drive for Desktop](#), [OneDrive](#), or [iCloud Drive](#).

Reminder: Be sure to use the sectioning facilities of Mathematica notebooks: use a separate section or subsection for each problem. Be sure to use text cells (not input cells) for your verbal explanations and mathematical proofs. Be sure that you have mastered entering text and mathematics in text cells (e.g., via the [Hands on Start to Mathematica](#).)

Assignments

Academic Integrity Statement: As described in class, I encourage discussion of the homework. However, submitted homework must be written up on your own, without looking at solutions produced by others. So near the top of your submitted homework, please include the following signed statement:

“I completed this assignment without looking at the work of other, and I did not show this work to other students. I have queried an AI only where permitted.”

Bibliography

- Boughton, J. M. and E. R. Wicker (1979). The behavior of the currency-deposit ratio during the great depression. *Journal of Money, Credit and Banking* 11(4), 405–418.
- Frankel, J. A. (1986). International capital mobility and crowding out in the U.S. economy: Imperfect integration of financial markets or goods markets? In R. Hafer (Ed.), *How Open Is The U.S. Economy?*, Chapter 2, pp. 33–67. Lexington, MA: Lexington Books.
- Meyer, A. and S. Frederick (2023). The formation and revision of intuitions. *Cognition* 240, 105380.
- Steindel, C. (1995, December). Chain-weighting: The new approach to measuring GDP. *Current Issues in Economics and Finance* 1(9), 1–6.
- Trabandt, M. and H. Uhlig (2011). The Laffer curve revisited. *Journal of Monetary Economics* 58(4), 305–327.
- Velleman, D. J. (2019). *How to Prove It: A Structured Approach* (3rd ed.). Cambridge, UK: Cambridge University Press.

Previous Assignment