MATLAB Programming Language

Fall 2022

About This Course

Instructor / TA contact information:

- Office: EC709
- Office hour: 12-1 pm Tue./Fri., or by appointment
- Phone: 56689
- E-mail: wangts@cs.nctu.edu.tw
- Course web site: Use eCampus3
- TAs: all my first-year graduate students
- TA office: EC639

This is an English-medium course. Course materials and lectures are all in English. Discussions and individual interactions can be in Chinese.

Requirements / Grading

- [40%] Individual programming assignments (x4)
  - To be graded on both correctness AND performance.
- No written exams
- [40%] On-machine exams x2 (during class time)
- [20%] Lab sessions (starting in week 2)
  - If you miss or cannot complete some lab session for valid reasons, you can arrange with the TAs to do make-up demo within one week.

Course Schedule

- Week #1 (9/13): Introduction.
- Weeks #2-#8: Lab sessions 1-7
- Week 9 (11/8): Exam #1
- Weeks #10-#15: Lab sessions 8-13
- Week 16 (12/27): Exam #2
- Assignments will be due on weeks 5, 8, 12, 15.

- The regular class hour will mainly be for the labs.
- Lectures will be provided asynchronously as recoded videos between classes. Be sure to check and watch the lectures before the lab sessions. Corresponding slides will be available on E3.

Q&A about MATLAB

- What does "MATLAB" mean?
- Why learning MATLAB?
- Isn't MATLAB easy to learn? (Why taking a course?)
- What are MATLAB good for and what are not?

Backgrounds Needed

- Programming: You should know how to program in a high-level language. We will not spend much time on the basic concepts (such as Boolean logic, loops, functions, etc).
  - The ability of programming in C/Python is needed for the last topic.
  - If you are not familiar C/Python because you're not a CS major, I will provide alternative tasks for the respective programming assignment and/or exam problem.
- Some knowledge on linear algebra.

To Be Covered

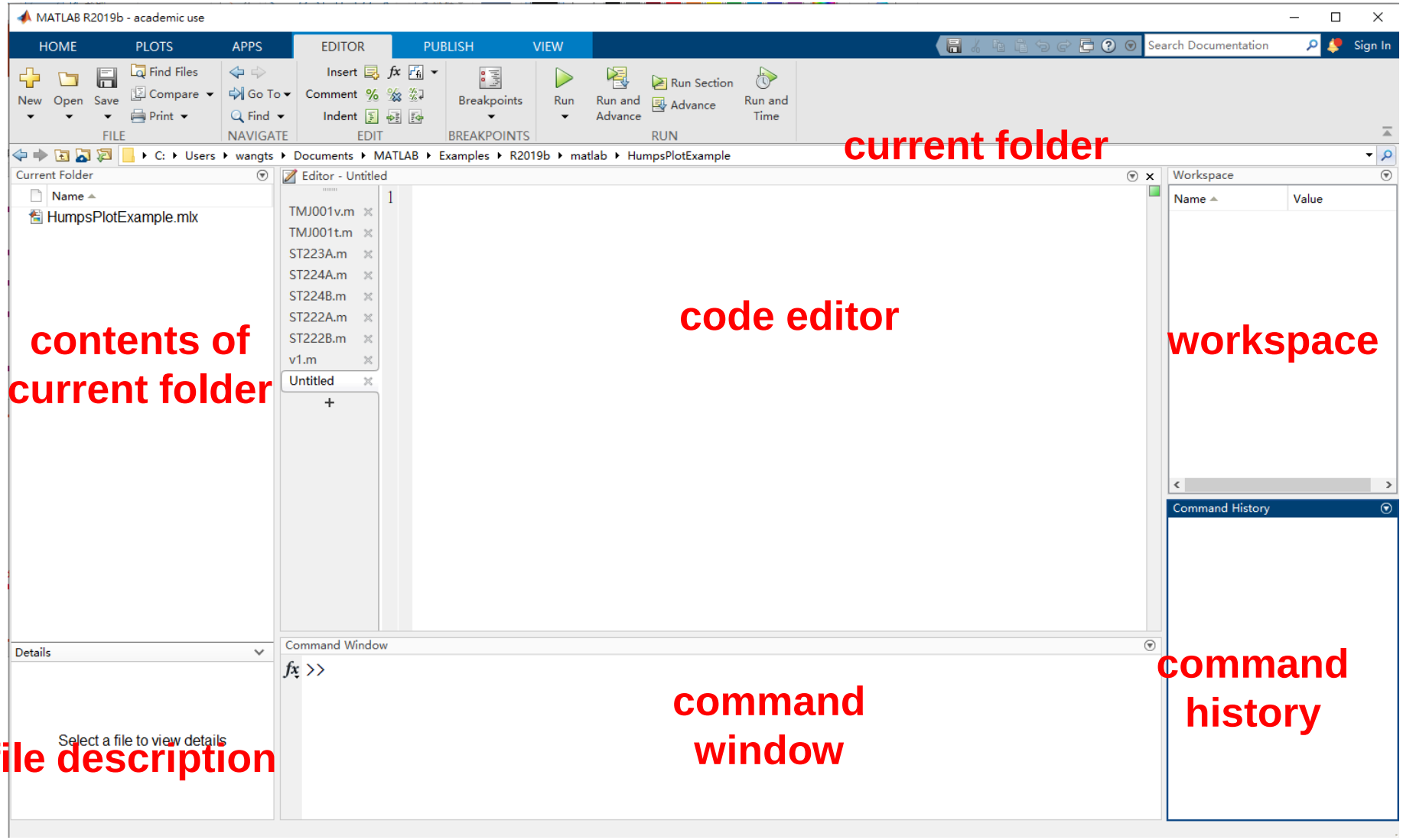
Beyond the basic aspects of programming, we will cover:

- Object-oriented programming in MATLAB
- User interaction and GUI programming (event-driven programming)
- Combining C/Python and MATLAB in both directions.
- A couple of simple but practical applications (e.g., a classification problem).

Additional Notes

- The slides are not intended to be used as manuals. Many functions are listed so that you know they exist. For their usage, look into the MATLAB documentation.
- We will cover little, if any, about the many MATLAB toolboxes, as most of them require specific domain knowledge to use.
- Even with something as convenient as MATLAB, try to keep your programs organized, modularized, and documented.
- You are allowed (and encouraged) to check the many online MATLAB resources available when doing your assignments. However, don't do copy-and-paste.
- Cheating in exams will result in failing the course and serious disciplinary action from the school.

Using MATLAB – A Quick Look



Using MATLAB – A Quick Look

- **Command Window**: Where you can type interactive commands and where the text outputs are displayed.
  - You can use this place to test codes very easily.
- **Current Folder**: This is the default path for loading/saving data or programs.
  - Create separate ones for different projects.
- **Workspace**: This holds all the variables used in the interactive (command-window) mode. (In other words, this is the "interactive" scope.)
- **Command History**: Previously typed commands. You can also use the UP/DOWN arrow keys in the command window to access the history items.

MATLAB File Extensions

- ***.m** files: MATLAB source codes.
- ***.mat** files: MATLAB data files.
  - In addition, MATLAB can also read/write regular text or binary files.
- ***.mex*** files: Binaries (similar to DLLs) of programs written in other languages and compiled with appropriate options so that they can be called within MATLAB.
- ***.fig** files: Files that hold figures (including the associated data) so that they can be displayed directly. Also used for storing GUI layouts (older versions).
- ***.mlapp** files: GUI-based app, containing both the layout and code in one file.
- ***.mlx** files: Live-script files (i.e., notebooks).

To-Do Now

- Get a copy from the Computing Center. It is free for you now.
- If you have no previous MATLAB experience, start by following the online tutorial (MATLAB itself, or other online resources) and get yourself familiar with both the interface and the language.
- Make sure you have an account to log into the computers in the computer lab.

Course Line Community

- This is optional.
- The purpose of this community is for quick communication and Q&A only.
- Course material (slides, lectures, assignments) are still on E3, not here.
- Nickname format:

  "Your-real-name (dept./year)"
- Link: https://line.me/ti/g2/TtTfanL5Cg8W2VDTNoO8PXfZizFxQqoJFPDVSw?utm_source=invitation&utm_medium=link_copy&utm_campaign=default