SigSys II and NumMeth: MATLAB tips and resources

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MATLAB

As a tool:

- Engineering tool, started with LA, now much more
- Extensive amount of research functionality
- Widely used at ETH, (engineering) academia in general

As a language:

- Dynamically-typed and interpreted
- Great for prototypes, less so for larger projects
- Powerful, very user-friendly debugger

Available resources

Large amount of tutorials available:

- MATLAB's searchable official documentatation
  - Documentation much more extensive than what `help somecommand`
  - Scroll down on these pages, often there are even usage examples
- MATLAB's own getting started guide
- MATLAB's online language fundamentals guide

$\Longrightarrow$ Purpose of these slides: Help you better find help on your own

Important in all of programming: Experiment!

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- Path:
  - List of folders in which MATLAB looks for functions and classes.
  - User-settable, defines precedence of functions.

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  - if else.
- Scripts, functions, anonymous functions.

Debugging

Tutorial: Mathworks website

- Start debugger if error is found: `dbstop if error`
- Continue running the code normally: `dbcont`
- Exit debugger: `dbquit`

Alternatives

- Octave
  - Free "clone" of MATLAB.
  - Not all the same functionality, but code almost the same.
  - Has a GUI.
- Python
  - Free, also after you graduate.
  - Widely used in different fields, Deep Learning - TensorFlow, PyTorch.
  - Some useful packages: NumPy, SciPy, SymPy, control.
  - Less unified, sometimes less well-documented and "ready-to-use".

Recommendation: Start with MATLAB, keep an eye on Python.