KU LEUVEN

MATLAB

m-files basics: script

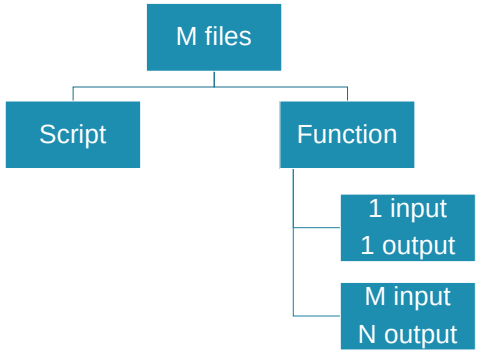
1

M-files

- ASCII text files that contain sequences of MATLAB commands (.m file extension)
- 2 kinds of M-files:
  - **script files** - automate long sequences of commands
  - **function files** - extend MATLAB by developing new commands
- Can be created in MATLAB editor or an editor of your choice

KU LEUVEN

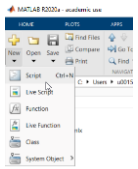
2



KU LEUVEN

4

Script



- Automation: MATLAB m-files are the solution!
  - You can create a script that can be repeatedly executed
  - This is the basic MATLAB program
- Scripts are simply text files containing MATLAB statements
  - You can use any text editor but the built-in editor indents and uses color to highlight the language syntax
  - Script files always have the ".m" extension, e.g., m-files
- Execute a script by typing the filename at the MATLAB prompt
- When a script (m-file) is executed, it is simply read sequentially and each line is presented to the MATLAB command prompt just like it was typed by hand
- Parsed and loaded into memory every execution

KU LEUVEN

5

Script

- Create / store variables in base workspace that is shared with other scripts and with the MATLAB command line interface
- Does not accept input arguments or return output arguments
- Useful for automating a series of steps you need to perform many times.
- Filename starts with a character and ends with the extension .m

KU LEUVEN

6

Script

- Create a script
  - Select from menu
  - Editor opens
  - Commands can be entered (cfr. Notepad, Notepad++)
- Save the script
  - Filename can only contain letters (lowercase, uppercase), numbers and _
  - The first character must be a letter.
  - Spaces are not allowed.
  - Make sure your file name is not the same as one of MATLAB's commands/functions
  - Tip: use `type filename` or `which filename` to check if the filename already exists

KU LEUVEN

7

Structure m-file

M-File Element	Description
Function definition line (functions only)	Defines the function name, and the number and order of input and output arguments
H1 line	A one line summary description of the program, displayed when you request `help` on an entire directory, or when you use `lookfor`
Help text	A more detailed description of the program, displayed together with the H1 line when you request `help` on a specific function
Function or script body	Program code that performs the actual computations and assigns values to any output arguments
Comments	Text in the body of the program that explains the internal workings of the program

File: script_help_01.m

KU LEUVEN

8

Script

- Running a script
  - Type the file name in the command window
  - In the editor-window: click on run-icon
- Follow-up of the script
  - echo on / echo off (in command window)
- *Files:*
  script_01.m
  script_02.m

KU LEUVEN

10

Script

- Good practices:
  - Start script by clearing the work space
    - `clear all`
  - Put comments (starting with %) in your code
  - Putting %% enables you to organize the code, it creates a new section

11

Using and Abusing Scripts

- All variables used are stored in the workspace.
- All the variables created by the script file are "left behind" when the script finishes. Can result in errors for subsequent scripts, that are difficult to track all scripts share same base workspace
- The script can be influenced by the status of the variables in the workspace.
- Variables with the same name are written over!
  Variables can be confused and mis-used (may accidentally overwrite a previously defined variable)
  If a vector is replaced by a scalar, in subsequent calculations an error can appear, but if a scalar is replaced (unintentional) by a scalar, a subtle error
- No warning of variables being changed

12

Using and Abusing Scripts

- Scripts can call other scripts
  - Can *chain* together individual small programs
  - Each script can be tested and debugged separately
  - *File: script_master_01_02.m*
- MATLAB statements themselves are not printed out, but the result of each statement is, unless a semicolon ends it, suppressing the output

13