
Introduction to Matlab

LAB 1

What is Matlab?

- A software environment for interactive numerical computations

 - Examples:
 - Matrix computations and linear algebra
 - Solving nonlinear equations
 - Numerical solution of differential equations
 - Mathematical optimization
 - Statistics and data analysis
 - Signal processing
 - Modelling of dynamical systems
 - Solving partial differential equations
 - Simulation of engineering systems
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Matlab Screen

Command Window

- ✓ type commands

Current Directory

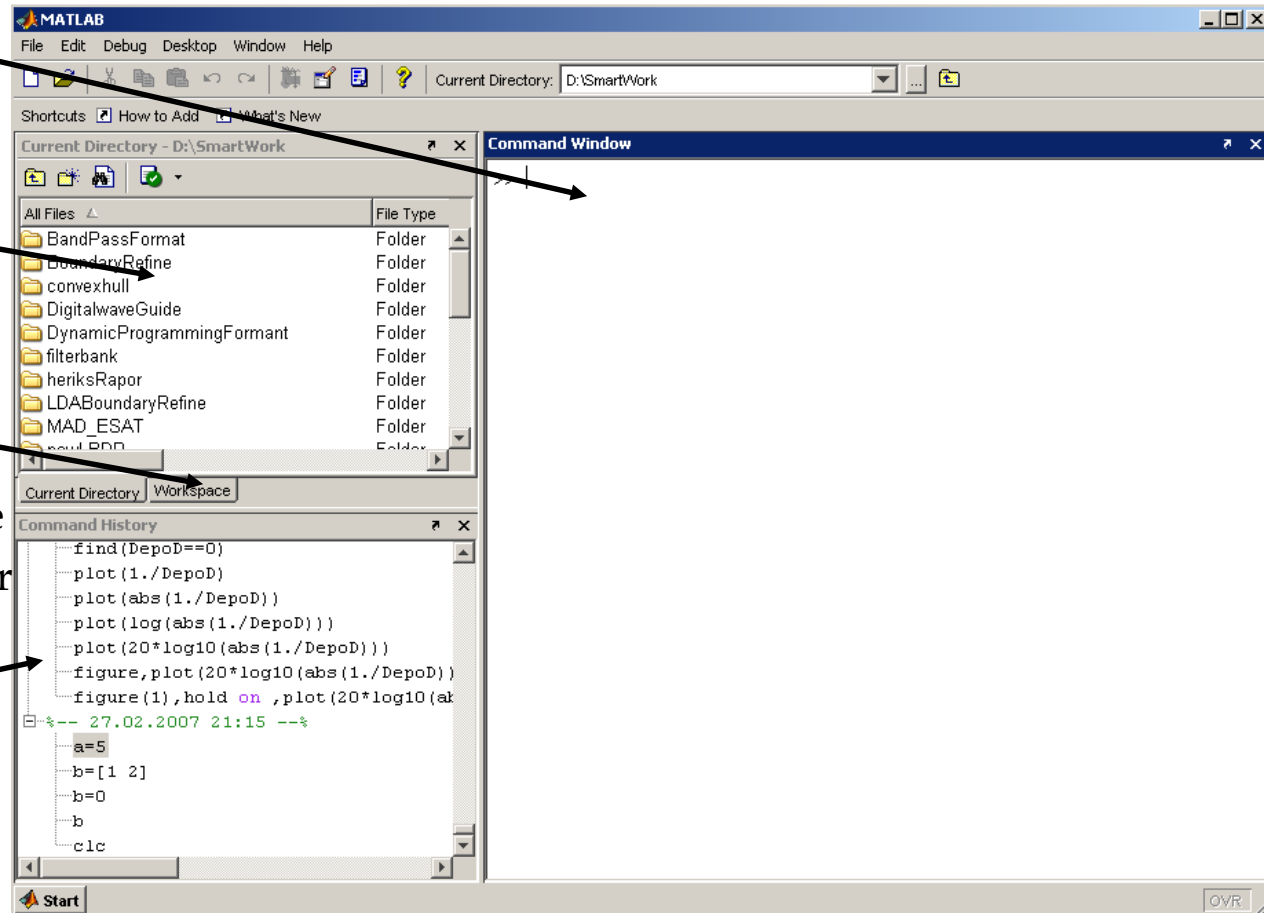
- ✓ View folders and m-files

Workspace

- ✓ View program variables
- ✓ Double click on a variable to see it in the Array Editor

Command History

- ✓ View past commands
- ✓ Save a whole session using diary



MATLAB Variable Names

- Variable names ARE case sensitive
 - Variable names must start with a letter followed by letters, digits, and underscores.
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MATLAB Special Variables

ans	Default variable name for results
pi	Value of π
eps	Smallest incremental number
inf	Infinity
NaN	Not a number e.g. 0/0
i	square root of -1

MATLAB Math & Assignment Operators

Power \wedge or $\cdot \wedge$ $a \wedge b$ or $a \cdot \wedge b$

Multiplication $*$ or $\cdot *$ $a * b$ or $a \cdot * b$

Division $/$ or $\cdot /$ a / b or $a \cdot / b$

or \backslash or $\cdot \backslash$ $b \backslash a$ or $b \cdot \backslash a$

NOTE: $56 / 8 = 8 \backslash 56$

Addition $+$ $a + b$

Subtraction $-$ $a - b$

Assignment $=$ $a = b$ (assign b to a)

Interactive Calculations

- Matlab is interactive, no need to declare variables
 - `>> a=5`
 - `>>b=a/2`
 - `>> a=2+3*4/2`
 - `>> a=5e-3;`
 - `b=1;`
 - `c=a+b`
 - Most elementary functions and constants are already defined
 - `>> cos(pi)`
 - `>> abs(1+i)`
 - `>> sin(pi)`
 - Last call gives answer `1.2246e-016` !?
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