MA2252 Introduction to Computing

Lecture 2: MATLAB Basics (contd.)

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Learning outcomes

- Performing basic arithmetic in MATLAB
- Understanding logical expressions and operators

Arithmetic operators

In decreasing order of precedence:

- Exponentiation ^
- Multiplication * and Division /
- Addition + and Subtraction -

Note: To prioritise an arithmetic operation, use parantheses ().

Try this! (20+10)/5 and 20+10/5

Arithmetic operators (contd.)

Demo

Arithmetic functions

Some basic arithmetic functions are

- Trigonometric functions: sin, cos, tan, asin, acos, sec, cot etc.
- Exponential and Logarithmic functions: exp, log, log2 and log10
- Other useful functions: sqrt, factorial, abs etc.

Arithmetic functions (contd.)

Demo

Function help

Use MATLAB's help command to get help about any function.

In the command window,

- type help 'space' 'function name' and press Enter

  or

- type the name of function, right click on it and select the option 'Help on <function name>'

Function help (contd.)

Demo

Output display formats

Use format command to change the look of output.

Examples:

- format short $\longrightarrow$ displays 4 decimal places
- format bank $\longrightarrow$ displays 2 decimal digits
- format long $\longrightarrow$ displays total 16 digits
- format compact $\longrightarrow$ displays single space between commands

Output display formats (contd.)

Demo

Logical Expressions

- A logical expression is a statement which can be true or false.
- Example: a<b
- Complicated logical expressions can be built by changing the operator relating a and b

Operators

Comparison operators in MATLAB:

- $<$ (less than)
- $<=$ (less than or equal to)
- $>$ (greater than)
- $>=$ (greater than or equal to)
- $\sim=$ (not equal to)
- $==$ (equal to)

Important: Notice the difference between $=$ and $==$ in MATLAB.

Operators (contd.)

Logical operators in MATLAB:

- && (and)
- || (or)
- $\sim$ (not)

Operators (contd.)

Decreasing order of precedence:

- Parantheses ()
- Exponentiation ^
- Logical negation $\sim$
- Multiplication * and Division /
- Addition + and Subtraction -
- Comparison operators
- &&
- ||

Note: MATLAB executes operators with same order of precedence from left to right.

Operators (contd.)

To check your understanding of logical operators, let's do a mentimeter poll.

Please go to the link `https://www.menti.com/alnjbdme5zsg` provided in chat

or

visit `https://www.menti.com` and enter the code **64796163**

Operators (contd.)

More examples of logical expressions:

- $(x < 2)||(x > 5)$
- $x \sim= 0$
- $a < x < b$
- (2+2)==4

Note: MATLAB assigns 1 value to 'TRUE' logical expressions and 0 value to 'FALSE' logical expressions.

Operators (contd.)

Demo

End of Lecture 2

Please provide your feedback here