MATLAB integrated development environment (IDE).

Computing on the Command Line

Computing by writing and running script file programs

Variables: Naming conventions

Data types: doubles, logical variables, strings, structures, etc.

Arrays: 1D, 2D and multidimensional arrays

Creating arrays: [ , ; ], using the colon operator and the linspace function

Accessing array elements using scalar and vector indexing, (logical indexing will come later)

Adding elements outside the existing boundary of an array

Composite arrays: building larger arrays from smaller ones, replicate a matrix using: repmat

Deleting elements of an array

Special built-in arrays: zeros, ones, eye

Creating a diagonal array from a vector, and extracting the diagonal elements of a square array.

Arithmetic operations with arrays: +, -, .\*, ./, \*, /, .^, ^

Scalar expansion: operations of a scalar with arrays

Built-in functions

Length, size

Sum, mean, std

Sin, cos, sinh, etc.

Exp, log, log10

rand

Logical variables and expressions

relational operators and logical operators

logical indexing of a vector

the function find

Simulations

Branching mechanisms: if elseif

Looping mechanisms: for- and while-loops, break and continue

User-defined functions: anonymous functions, function files

Import and export data

Plotting graphs in 2D and 3D

Animations

Processing images

Processing sound

Interpolation

Zeros of a function

Solving Ordinary Differential Equations

Symbolic Manipulations