MATLAB Basics

Trevor Spiteri
trevor.spiteri@um.edu.mt
http://staff.um.edu.mt/trevor.spiteri

Department of Communications and Computer Engineering
Faculty of Information and Communications
University of Malta

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1 Desktop Areas

The default layout can be changed. To restore the default layout, click on the **View** menu, then click on **Desktop Layout**, then click on **Default**.

Current Directory — lists the files in the current directory. Change the directory using the `cd` command or the directory field in the toolbar.

Workspace — lists the local variables. Saving the workspace saves these variables for future sessions.

Command History — lists the previous commands used. Useful when repeating commands.

Command Window — where you type in new commands and expressions. To clear this window, use the `clc` command.

2 Online Help

To display help on a command in the Command Window, use the `help` command. For example, `help sin` displays help on the `sin` function in the Command Window.

To display help in the Help Browser, use the `doc` command. For example, `doc sin` displays help on the `sin` function in the Help Browser.

To look for a function based on a keyword, use the `lookfor` command. For example, `lookfor roots` displays a list of functions that have to do with roots.

Table 1: Basic operator precedence

Symbol	Operation
`()`	parenthesis
`^`	exponentiation: a^b
`*`	multiplication: ab
`/`	right division: $\frac{a}{b}$
`\`	left division: $\frac{b}{a}$
`+`	addition: $a+b$
`-`	subtraction: $a-b$

Table 2: Special variable names

Variable	Description
`ans`	The most recent answer.
`i`, `j`	The imaginary unit i, that is, $\sqrt{-1}$.
`pi`	The number π.
`Inf`	Infinity.
`NaN`	Not a Number, undefined result.

3 Operator Precedence

See Table 1 for a list of some basic operators and their precedence.

4 Variables and Workspace

Variable names are case-sensitive. The first character must be a letter, the rest may be letters, digits, or the underscore character.

There are some special variables. See Table 2.

The workspace refers to the names and values of the different variables. To clear the workspace, use the `clear` command. The form `clear old_var` clears just one variable, in this case, `old_var`. Saving the workspace saves a copy of all the variables that are defined.

The `whos` command lists the local variables and how much memory they are using.

5 Arrays

A row vector is an array with only one row, e.g.,

```
rv = [1 2 3 4]
```

Table 3: Commonly used functions

Function	Meaning
`exp(x)`	e^x
`sqrt(x)`	$\sqrt{x}$
`log(x)`	$\ln x$
`log10(x)`	$\log_{10} x$
`sin(x)`	$\sin x$
`cos(x)`	$\cos x$
`tan(x)`	$\tan x$
`asin(x)`	$\sin^{-1} x$
`acos(x)`	$\cos^{-1} x$
`atan(x)`	$\tan^{-1} x$

A column vector is an array with only one column, e.g.,

```
cv = [1; 2; 3; 4]
```

A matrix is an array with more than one row and one column, e.g.,

```
mat = [11 12; 21 22]
```

6 Polynomials

Polynomials are stored as a vector. The elements of the vector are the coefficients. The first element is the coefficient of the highest power. For example, the polynomial

$$(x-1)(x-2) = x^2 - 3x + 2$$

is stored as `p = [1 -3 2]`.

The roots can be obtained using the `roots` function. `roots([1 -3 2])` returns the roots, 1 and 2.

The polynomial can be obtained using the `poly` function. `poly([1 2])` returns the polynomial `[1 -3 2]`.

7 Common Functions

MATLAB contains many commonly used functions. Table 3 shows some commonly used functions. Trigonometric functions use radians, not degrees.