

## Basic Syntax

Example	Description
<code>x = pi</code>	Create variables and assign values with the equal sign (=). The left side (x) is the variable name, and the right side (pi) is its value.
<code>y = sin(-5)</code>	Provide inputs to a function using parentheses.

## Desktop Management

Function	Example	Description
<code>save</code>	save data.mat	Save your current workspace to a MAT-file.
<code>load</code>	load data.mat	Load the variables in a MAT-file to the workspace.
<code>clear</code>	clear	Clear all variables from the workspace.
<code>clc</code>	clc	Clear all text from the Command Window.
<code>format</code>	format long	Change how numeric output appears in the Command Window.

## Array Types

Example	Description
4	scalar
[3 5]	row vector
[1;3]	column vector
[3 4 5; 6 7 8]	matrix

## Evenly Spaced Vectors

Example	Description
<code>1:4</code>	Create a vector from 1 to 4, spaced by 1, using the <a href="#">colon operator ( : )</a> .
<code>1:0.5:4</code>	Create a vector from 1 to 4, spaced by 0.5.
<code>linspace(1,10,5)</code>	Create a vector with 5 elements. The values are evenly spaced from 1 to 10.

## Matrix Creation

Example	Description
<code>rand(2)</code>	Create a square matrix with 2 rows and 2 columns.
<code>zeros(2,3)</code>	Create a rectangular matrix with 2 rows and 3 columns of 0s.
<code>ones(2,3)</code>	Create a rectangular matrix with 2 rows and 3 columns of 1s.

## Array Indexing

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Example	Description
<code>A(end,2)</code>	Access the element in the second column of the last row.
<code>A(2,:)</code>	Access the entire second row.
<code>A(1:3,:)</code>	Access all columns of the first three rows.
<code>A(2) = 11</code>	Change the value of the second element of an array to <code>11</code> .

### Array Operations

Example	Description
<pre>[1 2; 3 4] + 1 ans =      2     3      4     5</pre>	Perform <a href="#">array addition</a> .
<pre>[1 1; 1 1]*[2 2; 2 2] ans =      4     4      4     4</pre>	Perform <a href="#">matrix multiplication</a> .
<pre>[1 1; 1 1].*[2 2; 2 2] ans =      2     2      2     2</pre>	Perform <a href="#">element-wise multiplication</a> .

### Multiple Outputs

Example	Description
<code>[xrow,xcol] = size(x)</code>	Save the number of rows and columns in <code>x</code> to two different variables.
<code>[xMax,idx] = max(x)</code>	Calculate the maximum value of <code>x</code> and its corresponding index value.

### Documentation

Example	Description
<code><a href="#">doc randi</a></code>	Open the documentation page for the <code>randi</code> function.

### Plots

Example	Description
<code><a href="#">plot</a>(x,y,"ro--",LineWidth=5)</code>	Plot a red ( <code>r</code> ) dashed ( <code>--</code> ) line with a circle ( <code>o</code> ) marker, with a heavy line width.
<code><a href="#">hold on</a></code>	Add the next line to the existing plot.
<code>hold off</code>	Create new axes for the next plotted line.
<code><a href="#">title</a>("My Title")</code>	Add a title to a plot.

<code>xlabel("x")</code> <code>ylabel("y")</code>	Add labels to axes.
<code>legend("a", "b", "c")</code>	Add a legend to a plot.

## Tables

Example	Description
<code>data.HeightYards</code>	Extract the variable HeightYards from the table data .
<code>data.HeightMeters = data.HeightYards*0.9144</code>	Derive a table variable from existing data.

## Logical Indexing

Example	Description
<code>[5 10 15] &gt; 12</code>	Compare the elements of a vector to the value 12 .
<code>v1(v1 &gt; 6)</code>	Extract all elements of v1 that are greater than 6 .
<code>x(x==999) = 1</code>	Replace all values in x that are equal to 999 with the value 1 .

## Programming

Example	Description
<code>if x &gt; 0.5</code> <code>y = 3</code> <code>else</code> <code>y = 4</code> <code>end</code>	If x is greater than 0.5 , set y to 3 .  Otherwise, set y to 4 .
<code>for c = 1:3</code> <code>disp(c)</code> <code>end</code>	The loop counter ( c ) progresses through the values 1:3 (1, 2, and 3).  The loop body displays each value of c .