

Summary of MATLAB Onramp

Basic syntax

Example	Description
<u>x = pi</u>	Create variables with the equal sign (=). The left-side (x) is the variable name containing the value on the right-side (pi).
<u>y = sin(-5)</u>	You can provide inputs to a function using parentheses.

Desktop management

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

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
1:4	Create a vector from 1 to 4, spaced by 1, using the colon (:) operator.
1:0.5:4	Create a vector from 1 to 4, spaced by 0.5.
<u>linspace</u> (1,10,5)	Create a vector with 5 elements. The values are evenly spaced from 1 to 10.

Creating matrices

Example	Description
<u>rand</u> (2)	Create a square matrix with 2 rows and 2 columns.

Example	Description
<code>zeros(2,3)</code>	Create a rectangular matrix with 2 rows and 3 columns.

Indexing

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 an array to 11.

Array operations

Example	Description
<pre>[1 1; 1 1]*[2 2;2 2] ans = 4 4 4 4</pre>	Perform matrix multiplication .
<pre>[1 1; 1 1].*[2 2;2 2] ans = 2 2 2 2</pre>	Perform element-wise multiplication .

Multiple outputs

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

Documentation

Example	Description
<code>doc randi</code>	Open the documentation page for the <code>randi</code> function.

Plotting

Example	Description
<code>plot(x,y,"ro-","LineWidth",5)</code>	Plot a red (r) dashed (-) line with a

Example	Description
	circle (o) marker, with a heavy line width.
<code>hold on</code>	Add the next line to existing plot.
<code>hold off</code>	Create a new axes for the next plotted line.
<code>title("My Title")</code>	Add a label to a plot.

Using 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.

Logicals

Example	Description
<code>[5 10 15] > 12</code>	Compare a vector to the value 12.
<code>v1(v1 > 6)</code>	Extract all elements in 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
<pre>if x > 0.5 y = 3 else y = 4 end</pre>	<p>If x is greater than 0.5, set the value of y to 3.</p> <p>Otherwise, set the value of y to 4.</p>
<pre>for c = 1:3 disp(c) end</pre>	<p>The loop counter (c) progresses through the values 1:3 (1, 2, and 3).</p> <p>The loop body displays each value of c.</p>