

MATLAB Onramp

Conclusion

Additional Resources

Summary of MATLAB Onramp

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 <code>data.mat</code>	Save your current workspace to a MAT-file.
<code>load</code>	load <code>data.mat</code>	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 <code>long</code>	Change how numeric output appears in the Command Window.

Array Types

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

Evenly Spaced Vectors

Example	Description
<code>1:4</code>	Create a vector from 1 to 4, spaced by 1, using the colon operator (:).
<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

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> .
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Array Operations

Example	Description
<pre>[1 2; 3 4] + 1 ans = 2 3 4 5</pre>	Perform array addition .
<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 <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>doc randi</code>	Open the documentation page for the <code>randi</code> function.

Plots

Example	Description
<code>plot(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>hold on</code>	Add the next line to the existing plot.
<code>hold off</code>	Create new axes for the next plotted line.
<code>title("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 <code>HeightYards</code> from the table <code>data</code> .

<code>data.HeightMeters = data.HeightYards*0.9144</code>	Derive a table variable from existing data.
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Logical Indexing

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

Programming

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