

MATLAB QUICK GUIDE

When you open MATLAB you will see the following (note that the windows within MATLAB may be arranged slightly differently)

The image shows the MATLAB 7.6.0 (R2009a) interface. On the left is the Current Directory browser showing a file tree. The central Editor window contains MATLAB code for connecting to Yahoo! Finance and plotting AT&T stock prices. Below the Editor is the Command Window with a prompt. On the right is the Workspace browser showing a variable named 'ans'. Below the Workspace is the Command History window listing recent commands.

Current Directory: A window that shows which folder you are in and all the files that are in it

Editor: A place to write commands that can be saved and run in real time or later

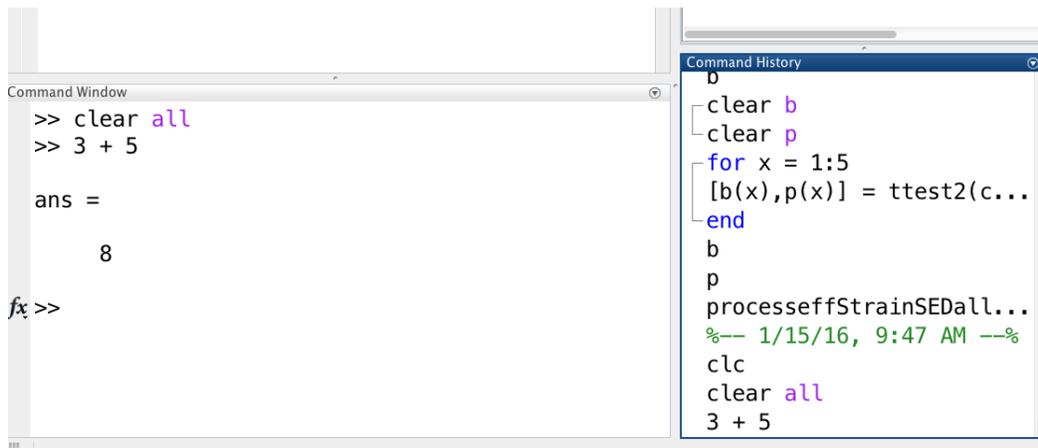
Workspace: Variables you define are displayed here

Command Window: A place to write commands, perform calculations

Command History: What you type in the box to the left of this one is saved here

Calculations can be done either in the "Command window" or the "Editor". The command window is a temporary place to see your commands, the commands themselves are saved in the "Command history", but not the answers. The solution to the calculation is displayed in the "Command Window" and stored in the "Workspace". If you do not assign a variable name to the calculation, the answer is stored in the default variable name "ans" .

For example, if we want to add $3 + 5$, we can type: $3 + 5$ in the Command Window.



```
Command Window
>> clear all
>> 3 + 5

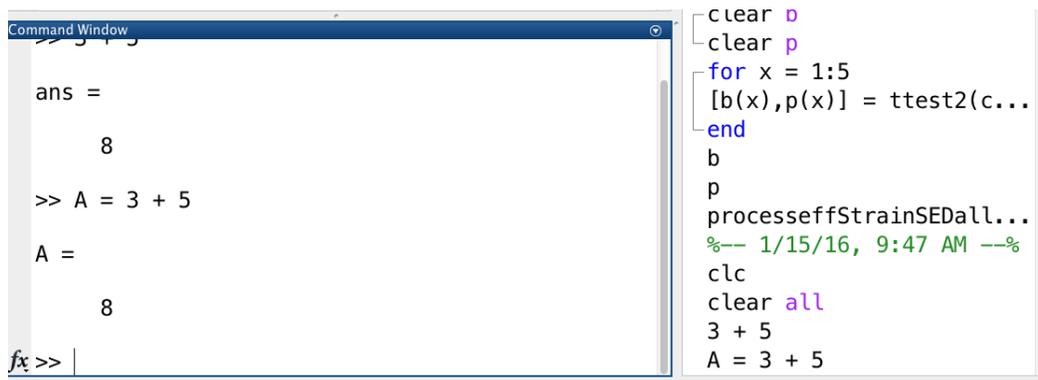
ans =

     8

fx >>

Command History
clear b
clear p
for x = 1:5
[b(x),p(x)] = ttest2(c...
end
b
p
processeffStrainSEDall...
%-- 1/15/16, 9:47 AM --%
clc
clear all
3 + 5
```

Now we can assign a variable to the answer:



```
Command Window
>> 3 + 5

ans =

     8

>> A = 3 + 5

A =

     8

fx >>

Command History
clear b
clear p
for x = 1:5
[b(x),p(x)] = ttest2(c...
end
b
p
processeffStrainSEDall...
%-- 1/15/16, 9:47 AM --%
clc
clear all
3 + 5
A = 3 + 5
```

Note that at this point, the answer is a variable of size (m,n) where m is the number of rows, and n is the number of columns. For this example, A is a 1×1 array.

Often, you will be adding vectors - your variable would then be a 1×2 vector array (for 2-D problems) or a 1×3 array (for 3-D problems).

General guidelines

- Create your vectors as variables (e.g. $A = [1 \ 2 \ 3]$; $B = [3 \ 4 \ 5]$)
- Perform secondary calculations using these variables and save this as another variable (e.g. $C = A + B$)
- DO NOT round intermediate calculations
- Give your variables meaningful names (e.g. force1, F1, moment1, fAB for a force going from A to B)

Helpful MATLAB commands

- add = +
- subtraction = -
- multiplication = *
- division = /
- $\det(D)$: determinant of a square matrix
- $\text{dot}(A,B)$: dot product of two vectors
- $\text{cross}(A,B)$: cross product of two vectors
- $\text{norm}(A)$: Magnitude of a vector
- $\cos(x)$ $\text{acos}(x)$
- $\sin(x)$ $\text{asin}(x)$
- $\tan(x)$ $\text{atan}(x)$
- $\cot(x)$ $\text{acot}(x)$
- $\csc(x)$ $\text{acsc}(x)$
- $\sec(x)$ $\text{asec}(x)$

- $\text{atan2}(x,y)$

Careful!!! MATLAB defaults to radians, so if you want to use degrees you have 2 options:

- Cosd = cosine(in degrees)

OR

To convert from radians to degrees

- rad2deg (deg2rad also exists)
- Do the math itself
- π is predefined in MATLAB as "pi"