

## Basic Matlab Tutorial 1: Basics

### Starting Matlab

1. Start Matlab. If you are on a Windows systems, Matlab should be under the “Start” menu or often there is a shortcut on your desktop. On a Linux/UNIX system, open a terminal and type “matlab &.” On a Mac, double click on the “Launch Matlab” icon located in your Matlab directory in Applications.
2. No matter what system you’re on, once Matlab starts, you will get exactly the same thing. In particular, you will get the Matlab Command Window, and probably several other Matlab windows like Workspace and History. I recommend closing everything but the Command Window, but I’m old-school.

### Command Basics

3. The Matlab command window is the center of the Matlab universe (doesn’t look like much, though). The job of the command window is to sit there blinking, waiting for you to type something. Your job is to enter commands that tell Matlab what to do. This is very much like working from a UNIX or DOS command prompt.
4. We’ll start with a few basic commands. First, type “1+1” and hit return. Try typing some more complicated expressions. Matlab interprets parentheses in the usual, algebraic way. Compare the answers for “10-2\*3” vs. “(10-2)\*3.” What’s different and why?
5. Now, let’s create some variables. Type “ten=10” and hit return. Congratulations, you’ve now created your first variable. You can now enter “ten” instead of “10” in the expressions above. Try it. While “ten” may not be very interesting, Matlab has a few built-in constants like “pi” (you know, 3.1416) that are a bit more useful.
6. Variables like “ten” and “pi” are known as scalar variables. A more interesting class of variables are arrays. Enter “arr1d=[1 5 10]” at the command prompt. You have now created a table of numbers with 1 row and 3 columns and given it the name “arr1d.” To get numbers out of “arr1d” you use parentheses: “arr1d (3)” should return 10. As its name implies, arr1d is a one-dimensional array. 1D arrays are also known as vectors, and vectors can be both row vectors (like arr1d) or column vectors. To turn arr1d into a column vector, type “arr1d=arr1d’ ;” The “;” prevents Matlab from printing the output, this is useful for big arrays and if you already know the answer. To verify that arr1d is now a column, just type its name to see it printed.

7. Let's create a 2D array. Enter "arr2d=[1 2 3; 9 8 7]." This will create a 2D array with 2 rows and 3 columns, the ";" tells Matlab to start a new row. To access data in arr2d, we need to use two numbers, e.g. arr2d(j,k), where j specifies the row and k specifies the column. What do you need to type to access the 8 in arr2d? Try replacing the 8 with -8.
8. In a typical Matlab session, you will create several variables, and its important to know what variables are in your workspace and their sizes. To list the contents of your workspace, type "whos" . If you have a variable that you no longer need, you can delete the variable by typing "clear " followed by the name of the variable (or variables you want to delete). Type "clear ten" and then "whos" to make sure ten is gone. We're done with the variables we created. Type "clear" to clear everything.