

A Quick Introduction to Matlab

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1 Using Matlab

The best place to start learning Matlab is through a Manual. You can find copies of all manuals online at the Mathworks homepage:

<http://www.mathworks.com/access/helpdesk/help/helpdesk.shtml>

Especially you might want to check out

<http://www.mathworks.com/access/helpdesk/help/techdoc/basics/getstarted.shtml>

From Matlab you get access to Matlab's help functions by typing either

```
>> help;
```

or

```
>> helpwin;
```

(>> refers to the Matlab prompt and should not be typed.) Also, Matlab has a variety of demos available. Type

```
>> demo;
```

to see a list.

Another nice introduction to Matlab is available on-line at
http://www.rit.edu/~pneveme/Matlab_Course/DEFAULT.HTM

2 Programming

Programming in Matlab is much easier than programming in other languages or programs like Maple. Matlab offers a powerful programming language which has most commands you might know from other languages like, for, repeat until, if else, and so on. Information about basic programming can be found at the above mentioned getstarted webpage.

Matlab distinguishes two types of programs: Scripts and Functions. Both types must be files with the ending `.m`.

2.1 Scripts

Scripts do not accept input arguments or return output arguments. They operate on data in the workspace. The script has access to all data in the workspace.

To write a script, you can use any editor (You can invoke Matlab's own editor by typing `edit`). For example you could create the following in an editor:

```
disp('Plotting the Sine is fun');
fplot('sin(x)',[-2*pi 2*pi]);
hold on
fplot('sin(2*x)',[-2*pi 2*pi], 'r');
```

and save it in your Matlab working directory as `sinescript.m`. Then, in Matlab at the prompt, typing

```
>> sinescript
```

will call the script, invoke the commands and plot two sine curves.

2.2 Functions

Functions are M-files that can accept input arguments and return output arguments. The name of the M-file and of the function should be the same. Functions operate on variables within their own workspace, separate from the workspace you access at the MATLAB command prompt. Functions only have information available which is passed to them through the function call. For example we could write the following file:

```
function sinefunction(xstart,xend);

fplot('sin(x)', [xstart xend]);
```

and save it as `sinefunction.m`. Then typing in Matlab

```
>> sinefunction(-2*pi,2*pi);
```

will plot a sine from -2π to 2π .

3 Dfield5 and PPlane5

Two very nice programs are available from John Polking at Rice University:
<http://math.rice.edu/~dfield/>

These programs are already on the 10 PCs in Weber (rooms 201, 208). To start the program `dfield5`, simply type

```
>> dfield5
```

at the Matlab prompt. Also at the Web-page mentioned above, there is a Java version available which allows you to use the programs through your Web browser. Get familiar with these programs since you will use them a lot for the labs.