

Computer assignments will be mixed in with the homework assignments. You can use the software of your choice. To work problems that require numeric calculation, Matlab is often a good choice. An excellent “Matlab 6.x Tutorial” is available on the UT Austin Web site at

<http://www.utexas.edu/cc/math/tutorials/matlab6/matlab6.html>

A student version of Matlab for the PC or Mac may be purchased at the bookstore for roughly \$100.

There are versions of Matlab for public use available at the Learning Resource Center in ENS 507, the Computation Center facilities (which includes UNIX and OpenVMS systems), and the Student Microcomputing Facility (SMF). The Matlab Toolboxes that are available are as follows:

- UNIX/OpenVMS: Signal Processing, Control System, Optimization, System Identification, and Image Processing
- SMF (Macintosh & PC/Windows): Signal Processing, Control System, Optimization, and Image Processing

The SMF is located on the second floor of the Flawn Academic Center (undergraduate library), and it contains many Macintosh and Dell PC computers. Matlab and the four toolboxes are available on all of these SMF machines.

Although the first few computer homeworks will help step you through Matlab, it is strongly suggested that you take the short courses that the UT Computation Center will be offering. The schedule for the Computation Center short courses on Matlab is available at:

<http://www.utexas.edu/computer/classes/topics/statistics.html>

For further information on short courses, contact the Computation Center Help Desk in WCH 6, 471-2727.

Consulting for Matlab is provided by Mathematical Services, math@cc.utexas.edu, 475-9400.

Matlab on Unix

The name Matlab is an abbreviation for Matrix Laboratory. As its name implies, this software package is designed for efficient vector and matrix computations. The primary data type in Matlab is an $N \times M$ two-dimensional array, with integer, real, or complex elements. Of course, $N \times 1$ and $1 \times M$ arrays are vectors, and a 1×1 array represents a scalar quantity. Matlab 4 only had a matrix data type. Matlab 5 includes other data types.

Matlab is an interactive program that interprets expressions involving scalar, vector, or matrix quantities and displays the results. The syntax is simple and straightforward, and is similar to C and Fortran. For example, the following lines would define a 2×3 matrix A , then define a 3×2 matrix B , and finally compute the matrix C that is the inverse of the transpose of the product of the two matrices A and B :

```
A = [1 2 3; 4 5 6];  
B = [7 8; 9 10; 11 12];  
C = inv((A*B)')
```

Running Matlab

On the Unix machines in the Learning Resource Center, Matlab is installed in the directory `/usr/local/packages/matlab`. The Matlab executable is installed in the `/usr/local/bin` directory, which should already be on your path. To run Matlab, type

```
matlab
```

When Matlab begins running, it will automatically execute the commands in your initialization file, if you have one. On UNIX systems, your initialization file must be `/matlab/startup.m`. Note that at the other campus facilities, Matlab may be installed in the `/usr/local/matlab` directory.

Matlab Introduction

To get an introduction while running Matlab, type:

```
intro
```

Matlab Documentation

There is online documentation for Matlab, in the form of a man page. Once you've modified your search path to include `/usr/local/matlab`, you can view the Matlab man page by typing:

```
man matlab
```

To get help while running Matlab, type:

```
help
```

The Computation Center has Matlab manuals available for study or checkout in the Reference Room, WCH 9.