

## NUMERICAL ANALYSIS PROGRAMS IN MAPLE

### About the Program Disks

This README file gives instructions to the Maple programs on the disk. These programs are designed to run on a minimally configured computer. Minimal hard disk space plus the MapleV package are all that is really needed.

All of the programs are given as ASCII files with the .txt file extension or as Maple worksheets with the .mws file extension. The .txt files can be altered using any editor or word processor that creates a standard ASCII file. These are commonly called a "Text Only" file. The .mws files can only be altered within Maple.

The .txt files are included for use with McIntosh systems or for any other operating systems other than Windows or DOS.

To run the programs with the .txt extension under Maple, open the file as a "maple text" file. When presented with the "text format choice", select the option "OK". The file will be loaded as a Maple worksheet.

Once a worksheet is loaded into Maple, scroll to the top of the file and hit ENTER on the text portion of the line

```
> Restart;
```

This will reinitialize Maple and move the cursor to the next block. Keep hitting ENTER through the text or comment portion of the program. Hitting ENTER at the first program line will compile the program and send the cursor to the bottom of the file. The name of the file followed by (); such as

```
> alg021();
```

will be the command causing execution of the program.

Some of the programs require the input of large amounts of data or generate extensive output. To enable the programs to be run quickly and efficiently, the input data can be placed in data files and the data files read by the program. When the output is likely to be extensive, the programs have been constructed so that it is convenient to place the output directly into an output file. The program will prompt you for the form of the input or output you would like to use. For example, when running the program for Neville's method, ALGO31.MWS, using the defined data file ALGO31.DTA for the sample problem, you will first see a screen that states:

```
Choice of input method:
1.  Input entry by entry from the keyboard
2.  Input data from a text file
3.  Generate data using a function F
Choose 1,2, or 3 please
```

If you choose 1 you will need to enter all the data for the program from the keyboard, and any mistake in a data entry will require the program to be rerun. Choosing 2 will lead to the input data file ALGO31.DTA. Choosing 3 will cause the program to prompt you for the input of the function F.

The Maple programs are contained in four subdirectories MWS-5, TXT-5, MWS-6 and TXT-6. The MWS directories contain Maple worksheets for Windows(DOS) based versions of Maple. They illustrate the input and execution of the programs applied to the sample problems. The TXT subdirectories contain ASCII files with the extension .txt which can be used with any system running Maple. The .txt files must be opened using the type Maple text. These files will be converted by Maple to the appropriate worksheet for your system.

The directories MWS-5 and TXT-5 are for releases of Maple V before release 6. In particular, they run under Maple V release 5.3 and earlier. The main difference is in the syntax of the evaln command. The older releases used syntax of the form

```
evaln( a . (1..3));
```

to obtain

```
a1, a2, a3
```

This command is used in the programs ALG057.MWS, ALG057.TXT, ALG101.MWS, ALG101.TXT, ALG102.MWS, ALG102.TXT, ALG103.MWS, ALG103.TXT, ALG104.MWS AND ALG104.TXT to implement functions of several variables. In those situations the number of variables is input by the user along with the defining equations for each of the functions involved.

The directories MWS-6 and TXT-6 are for Maple V release 6. The syntax of the evaln command is changed to

```
evaln(a || (1..3));
```

The only programs affected are for Algorithms 5.7, 10.1, 10.2, 10.3 and 10.4.