

Lecture 9

Introduction to programming in

MATLAB

## **Introduction**

So far in these lab sessions, all the commands were executed in the Command Window.

The problem is that the commands entered in the Command Window cannot be saved and executed again for several times. Therefore, a different way of executing repeatedly commands with MATLAB is:

1. to create a file with a list of commands,
2. save the file, and
3. run the file.

If needed, corrections or changes can be made to the commands in the file. The files that are used for this purpose are called script files or scripts for short.

This section covers the following topics:

- M-File Scripts
- M-File Functions

### 4.2 M-File Scripts

A script file is an external file that contains a sequence of MATLAB statements. Script files have a filename extension `.m` and are often called M-files. M-files can be scripts that simply execute a series of MATLAB statements, or they can be functions that can accept arguments and can produce one or more outputs.

## Examples

Here are two simple scripts.

### Example 1

Consider the system of equations:

?

?

?

$$x + 2y + 3z = 1$$

$$3x + 3y + 4z = 1$$

$$2x + 3y + 3z = 2$$

Find the solution  $x$  to the system of equations.

Solution:

- Use the MATLAB editor to create a file: File → New → M-file.
- Enter the following statements in the file:

```
A = [1 2 3; 3 3 4; 2 3 3];
```

```
b = [1; 1; 2];
```

```
x = A\b
```

- Save the file, for example, example1.m.
- Run the file, in the command line, by typing:

```
>> example1
```

```
x =
```

```
-0.5000
```

```
1.5000
```

```
-0.5000
```

When execution completes, the variables (A, b, and x) remain in the workspace. To see a

listing of them, enter whos at the command prompt.

Note: The MATLAB editor is both a text editor specialized for creating M-files and a graphical MATLAB debugger. The MATLAB editor has numerous menus for tasks such as saving, viewing, and debugging. Because it performs some simple checks and also uses color to differentiate between various elements of codes, this text editor is recommended as the tool of choice for writing and editing M-files.

There is another way to open the editor:

36

```
>> edit
```

or

```
>> edit filename.m
```

to open filename.m.

Example 2

Plot the following cosine functions, y1