— University of Mosul —
College of Petroleum & Mining Engineering

"Computer Programing II /Theoretical"

Second class

Lecture …(3)….

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LECTURE CONTENTS

- Arithmetic Statement
- Using MATLAB as a calculator
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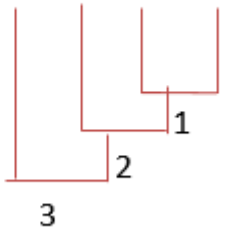
Arithmetic Statement

The arithmetic expression in MATLAB is equivalent to the arithmetic equation in algebra, MATLAB except that the name of the variable to be calculated must be on the left side alone without a sign while the arithmetic expression (the rest of the equation) is on the right side , as in the example below

Z-B=AX (ALGEBRA) ≈ Z=A*X +B (MATLAB)



Using MATLAB as a calculator

As an example of a simple interactive calculation, just type the expression you want to evaluate. Let's start at the very beginning. For example, let's suppose you want to calculate the expression, 1 + 2 × 3. You type it at the prompt command (>>) as follows,

```
>> 1+2*3

ans =

     7
```

will result in x being given the value 1 + 2 × 3 = 7.
This variable name can always be used to refer to the results of the previous computations. Therefore, computing 4x will result in

```
>> 4*x

ans=

   28.0000
```

Table 1.1: Basic arithmetic operators

Symbol	Operation	Example
+	Addition	$2 + 3$
−	Subtraction	$2 - 3$
*	Multiplication	$2 * 3$
/	Division	$2/3$

Before we conclude this minimum session, Table 1 gives the partial list of arithmetic operators.

Overwriting variable

Once a variable has been created, it can be reassigned. In addition, if you do not wish to see the intermediate results, you can suppress the numerical output by putting a semicolon (;) at the end of the line. Then the sequence of commands looks like this:

```
>> t = 5;
>> t = t+1
t = 6
```

Error messages

If we enter an expression incorrectly, MATLAB will return an error message. For example, in the following, we left out the multiplication sign, *, in the following expression

```
>> x = 10;
>> 5x
??? 5x
Error: Unexpected MATLAB expression.
```

Making corrections

To make corrections, we can, of course retype the expressions. But if the expression is lengthy, we make more mistakes by typing a second time. A previously typed command can be recalled with the up-arrow key ↑. When the command is displayed at the command prompt, it can be modified if needed and executed.

Controlling the hierarchy of operations or precedence

Let's consider the previous arithmetic operation, but now we will include parentheses. For example, 1 + 2 × 3 will become (1 + 2) × 3

```
>> (1+2)*3
ans =
      9
```

and, from previous example

```
>> 1+2*3
ans =
    7
```

By adding parentheses, these two expressions give different results: 9 and 7

Table 1.2: Hierarchy of arithmetic operations

PRECEDENCE	MATHEMATICAL OPERATIONS
First	The contents of all parentheses are evaluated first, starting from the innermost parentheses and working outward.
Second	All exponentials are evaluated, working from left to right
Third	All multiplications and divisions are evaluated, working from left to right
Fourth	All additions and subtractions are evaluated, starting from left to right

For operators of equal precedence, evaluation is from left to right.
Now, consider another example:
In MATLAB, it becomes

```
>> 1/(2+3^2)+4/5*6/7
ans=
      0.7766
```

or, if parentheses are missing,

$$\frac{1}{2+3^2}+\frac{4}{5}\times\frac{6}{7}$$

```
 >> 1/2+3^2+4/5*6/7
ans=
     10.1857
```

NOTE:-

- To clear the **Command Window**, type **clc** (Just clean the Command Window, with the variables and constants remaining in the Workspace)
- To clear the **Workspace**, type clear (Just clean the **Workspace**, with the variables and constants remaining in the Command Window).