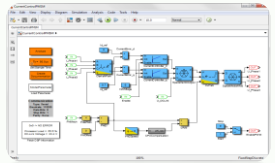
Review of Lecture 1

- MATLAB (MATrix LABoratory)
- **MATLAB has :**

Toolbox

Simulink



- **Open alternatives :** Octave, Scilab,
- **Main parts**
  1. Current folder
  2. Workspace
  3. Command window
  4. Command history
- **MATLAB online**

- **Basic arithmetic :** `+ - * / \ ^`
- **Priority of commands :** ( ) , ^ , * and / , + and -
- **Variables**
  1. **Begin with a letter** and can **contain letters, digits** and **(_);**
  2. MATLAB is case sensitive;
  3. **Reserved keywords**, cannot be used as identifiers.
- **Some reserved keywords and commands**

  Functions : `sin, cos, sqrt, exp, …`
  Constants : `pi, i, j, inf …`
  Commands : `who, whos, …`
- **Clearing screen and variables and quitting MATLAB :** `clc , clear, quit, exit.`

Info 3

Introduction to MATLAB

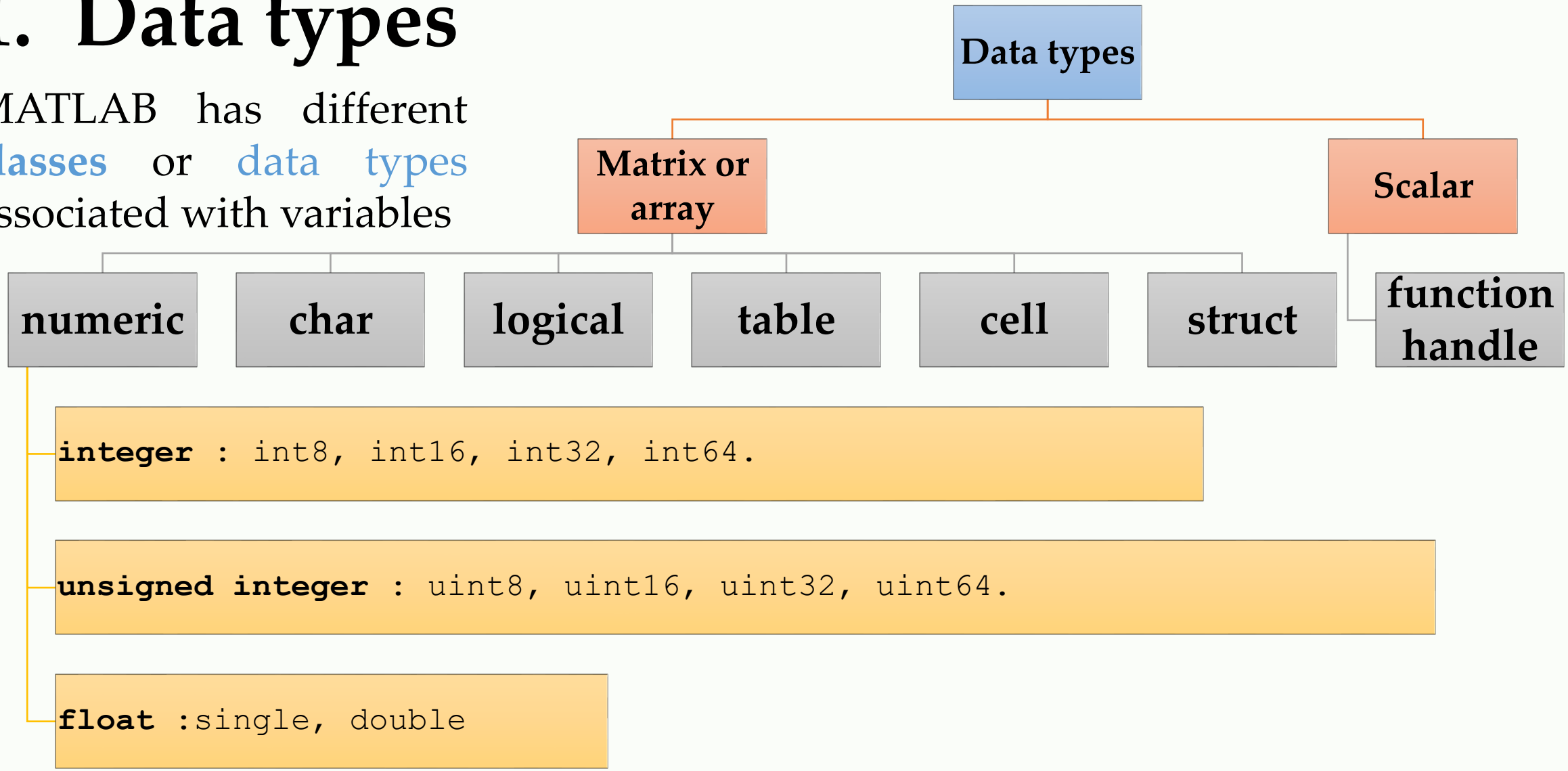
M. Bouzenita
2nd year Engineer - University of Jijel

Lecture 2

Data types and script file

1. Data types

MATLAB has different **classes** or data types associated with variables



1. Data types

- **Numeric:** Numeric class includes **Integer** and **floating-point numbers.**

Integer	`int8`	`int16`	`int32`	`int64`
Unsigned integers	`uint8`	`uint16`	`uint32`	`uint64`
Float			`single`	`double`
	(8 bits)	(16 bits)	(32 bits)	(64 bits)

Example :

```
>> A = int8(5);
>> B = uint32(30);
>> C = single (A);
```

1. Data types

- **Characters and strings**

  char and **string** are used to store the **alphabetic characters** (single character or character vectors) and **text data** respectively.

Example :

```
>> C1 = 'f';
>> C2 = 'abcd';
>>
>> S = "Engineer";
>>
```

(Double quotes (") was introduced in MATLAB R2017a)

1. Data types

- **Logical data**

  Logical type is used to represent the Boolean values **true** or **false** using **1** and **0** respectively.

  Relational operators :

  `>, <, >=, <=, ==` (equality) and `~=` (inequality).

  Logical operators :

  and : `&&`, or : `||`, not : `~`.

```
>> 3 < 2
ans =
    logical
     0

>> (3>=2)&&(5~=8)
ans =
    logical
     1
>> 3+2 == 5
ans =
    logical
     1
>> 3 = 3
3 = 3
  ↑
Error: The expression to the left
of the equals sign is not a valid
target for an assignment.
```

1. Data types

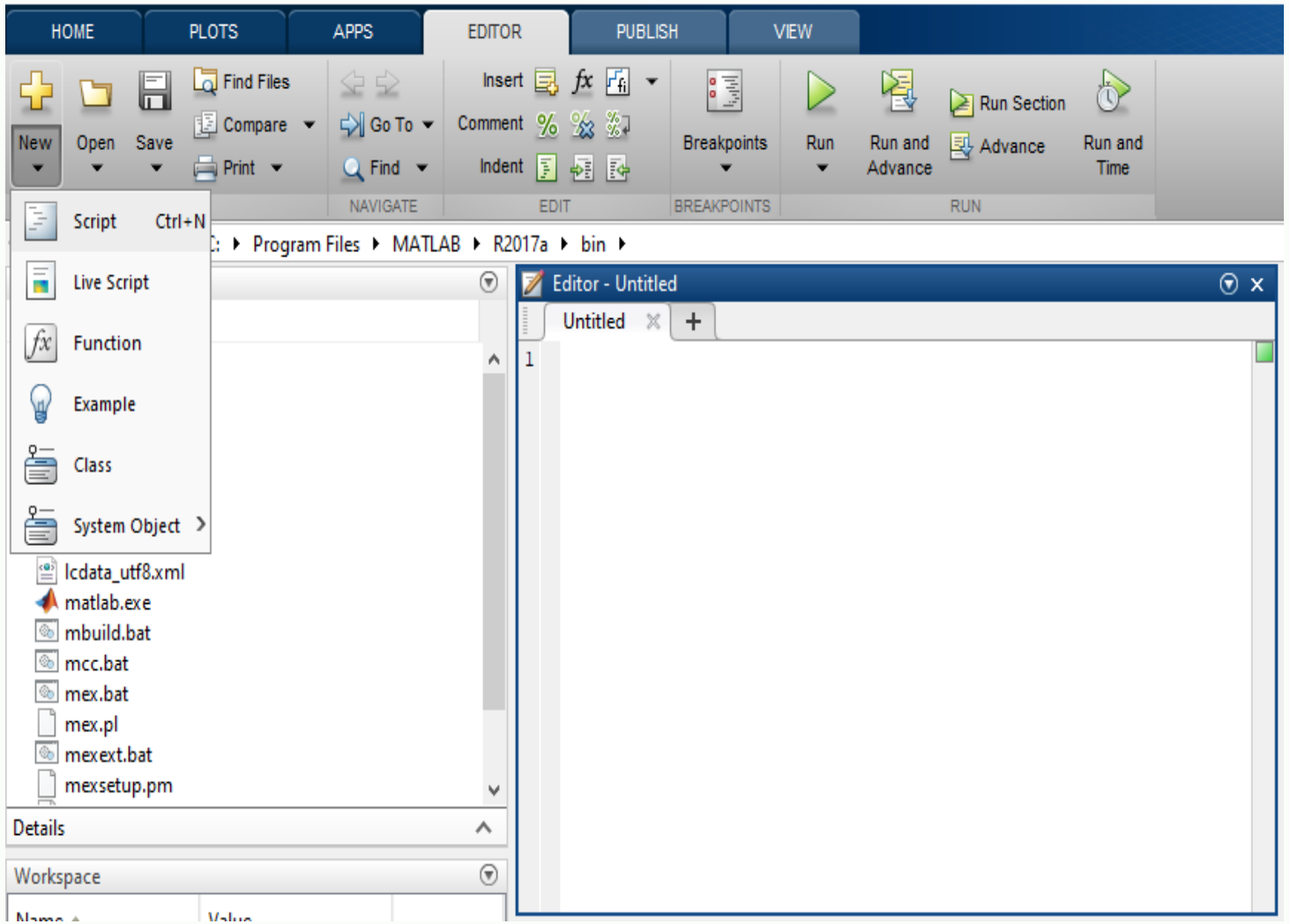
- **Tables :** They are used to package and store **tabular** data and used in general for data analysis.
- **Struct :** struct is used to store **arrays** of **varying** classes and sizes of data.
- **Cell :** Cells store **varying** classes of data in each cell, so they offer more **flexibility** to package data.
- **Function handle :** It is used to **point** and call a function.

2. File script

A **script** is an external file with **.m** extension, which contains a sequence of MATLAB instructions and commands.

The script file can be **edited**, **saved** and **executed**.

new script



2. File script

We can **edit**, **save** and **run** the script file in the command window using the following commands:

edit : `>> edit scriptName`
save: `>> save scriptName`
run : `>> scriptName`

`scriptName` indicates the name of the script.

```
>> edit my_program
```

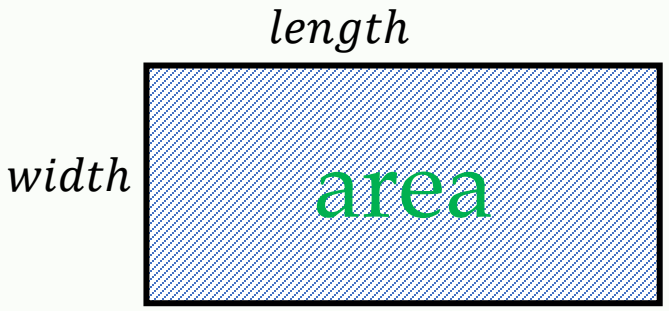
```
>> save my_program
```

```
>> my_program
```

2. File script

First example

Create a program to calculate the area of a rectangle



$$area = length * width$$

Variables

Rectangle area variable : `my_area`

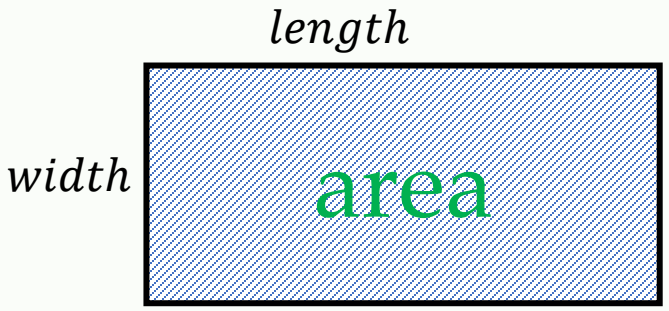
Length variable : `length`

Width variable : `width`

2. File script

First example

Create a program to calculate the area of a rectangle



$$area = length * width$$

Editor - D:\Univ jijel\2024-2025\MATLAB for 2nd year engineer\rect_area.m

rect_area.m

```
1 -
2 -   length = 20
3     width  = 10
4 -   my_area = length * width
```

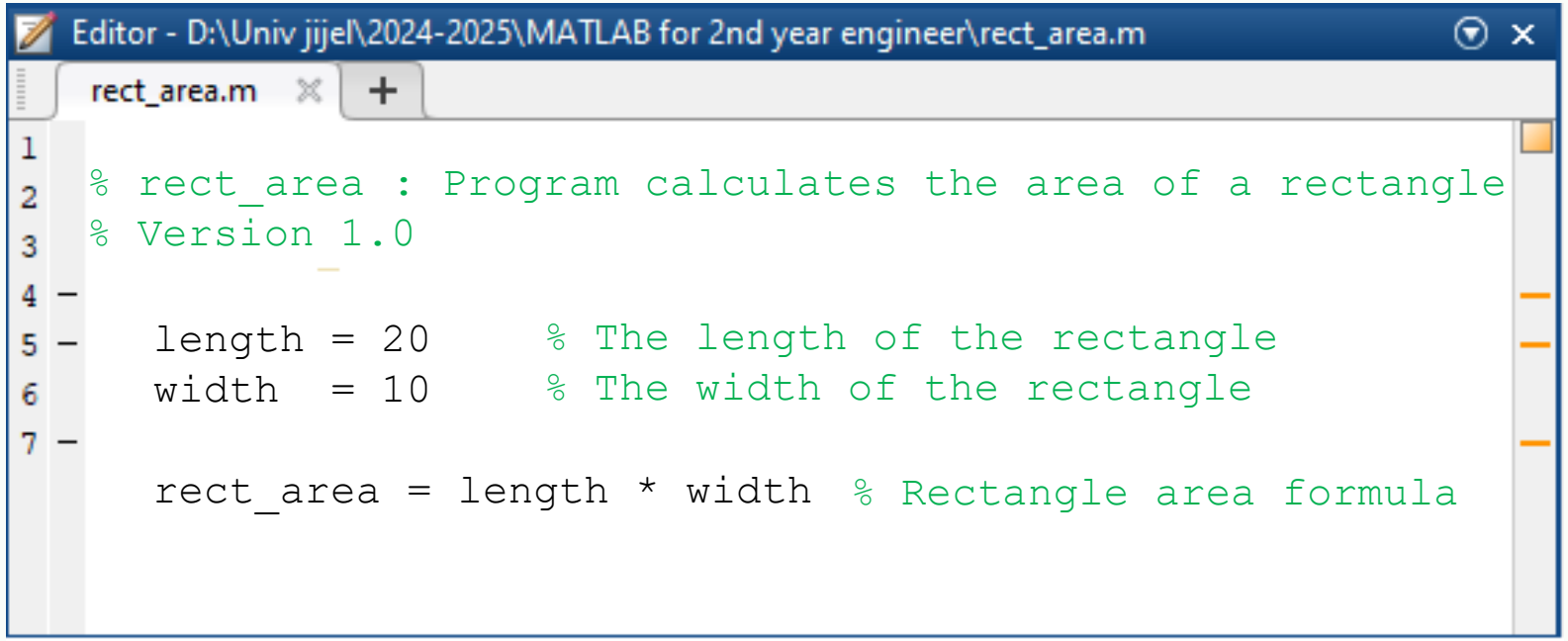
Command Window

```
>> rect_area

length =

     20

width  =

     10

my_area =

    200
```

2. File script

Comments

Clarify how the task is accomplished and give the user some insights regarding the developed algorithm.



The **first comments** at the beginning of the script are reserved to denote the script **help**

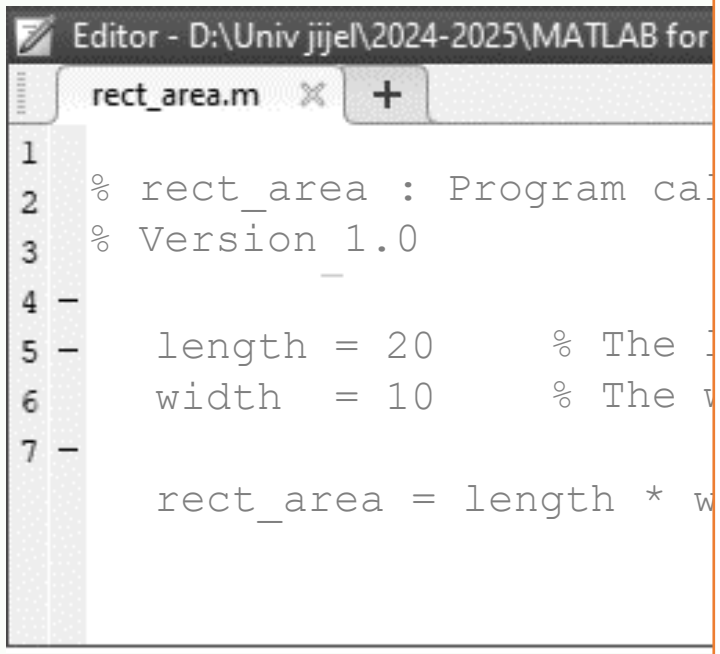
The comments are ignored when executing the script

2. File script

Comments

Clarify how the task is accomplished and give the user some insights regarding the developed algorithm.

The **first comments** at the beginning of the script are reserved to denote the script **help**




```
>> help rect_area

rect_area : Program calculates
the area of a rectangle
Version 1.0
```

The commer
executing th

Practice