# Review of Lecture 2

- **Data types**
  - **Numeric**

    **Integer** `( int8, int16, int32,int64)`

    **Unsigned integers** `( uint8, uint16, uint32, uint64`

    **Float** **(** `single, double )`
  - **Characters and strings**
  - **Logical data (true and false)**

    **Relational operators** : `>, <, >=, <=, ==, ~=`

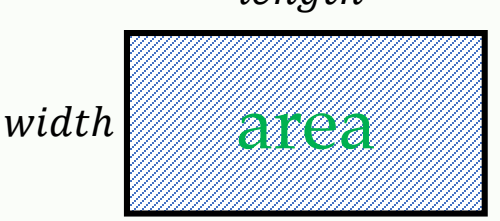
    **Logical operators :** `&&, ||, ~`
  - **Tables, Struct, Cell, Function handle**

- **File script**

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

```
>> edit scriptName
>> save scriptName
>> scriptName
```

**First example**




**Variables**

```
my_area
length
width
```

**Comments**

Clarify how the task is accomplished

The **comments** at the beginning denote the **help**

```
>> help rect_area
```

Info 3

# Introduction to MATLAB

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## Lecture 3

# Read, display and save data in MATLAB (1/2)

# 1. Read and display data in MATLAB

## The function `Input()`

This function allows **reading** data structure entered by users.

- The user can enter a **number**, and this value is stored in the variable 'N'
- To enter a **text** instead of a number, it is necessary to use **quotation marks** around the string
- In a more appropriate way, we must add **'s'** argument in the use of the input function.

```
>> N = input( 'Please enter a number:' )
Please enter a number:  5
N =
   5

>> Nm = input('Please enter a name:')
Please enter a name:    'Jijel'
Nm =
    'Jijel'

>> Nm = input('Please enter a name:','s')
Please enter a name:    Algeria
Nm =
    'Algeria'
```

# 1. Read and display data in MATLAB

## The function `disp()`

The `disp()` function is employed to display different kinds of data structure, such as **numbers** and **text**.

However, `disp()` **does not allow formatting.**

```
>> % Display values
>> A = 5; B = 10;
>> disp(A)
     5
>> disp(A + B)
     15
>> % Display text
>> disp('Hellow world')
Hellow world

>> msg = 'Good morning';
>> disp(msg)
Good morning
```

# 1. Read and display data in MATLAB

## The function `fprintf()`

The `fprintf()` function is used for displaying different data structures, where the **main characteristic** of this function is **controlling the format** of the displayed outputs.

`fprintf(formatSpec,A1,...,An)`, where:

`formatSpec` determines the format of the output and can include combinations of `'%'` character and a conversion character such as **`d, i, o, u, x, f, e, g, c,`** or **`s`**.

`A1,...,An` presents the variables needed to include the formatted output.

# 1. Read and display data in MATLAB

## The function `fprintf()`

**The `%s` format**: used to **format and display string** data, such as words, sentences, or text messages.

In this example, we use **`%s`** to insert the value of the **Name** variable into the formatted output.

The `\n` argument is used to move down to the next line.

If we display only **one character**, we can use **`%c`** format.

```
>> Name = "Ahmed";
>> fprintf('My name is %s\n', Name )
My name is Ahmed
```

# 1. Read and display data in MATLAB

## The function `fprintf()`

**The `%d` format**: used to **format and display integer** values in a specified format

In this example, we use **`%d`** to format and display the variable **`Age`**.

```
>> Age = 20;
>> fprintf('Ahmed is %d years old.', A
Ahmed is 20 years old.
```

# 1. Read and display data in MATLAB

## The function `fprintf()`

**The %f format**: This format is used to **display** the format of **floating-numbers**.

In other manner, the **`%f`** format helps **displaying the real numbers with decimal points** in the results.

In this example, we use the **`%f`** to determine the **format of floating-numbers**.

```
>> fprintf('The value of pi is %f \n',pi)
The value of pi is 3.141593
```

# 1. Read and displa in MATLAB

## The function `fprintf()`

### The %f format

We can add the ***width field*** before the formatting character **to indicate the number of characters used in printing**.

For example `%3d` and `%8s` indicate printing the variable with **3 numbers** and **8 characters** respectively.

In the case of the float variables, the ***width field*** specifies the number of decimal places..

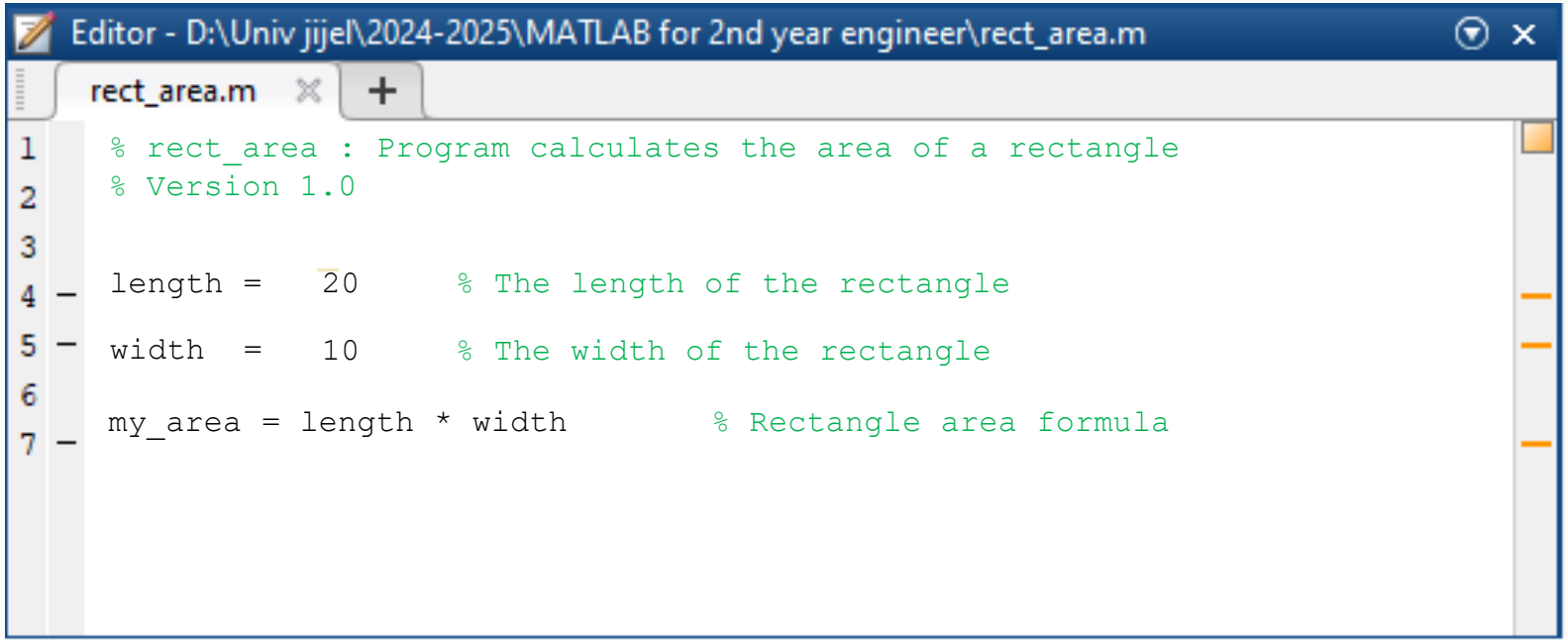
```
>> L = 5.371 ;
>> W  = 2 ;
>> fprintf('The length of the rectangle is : %3.2f \n', L)
The length of the rectangle is : 5.37
>> fprintf('The length of the rectangle is : %.2f \n', L)
The length of the rectangle is : 5.37
>> fprintf('The width of the rectangle is : %.1f \n', W)
The width of the rectangle is : 2.0
>> fprintf('The area of a rectangle with length %.2f  ...
and width %.1f is %.3f \n', L, W, L*W)
The area of a rectangle with length 5.37 and  width 2.0 is
10.742
```

# 2. Script with input an output functions

In our first script, we have created a program that calculates the area of a rectangle.

Now, we improve it by using the **input** and **output** functions to :

- let the user **enter the value of the length and the width**



# 2. Script with input an output functions

In our first script, we have created a program that calculates the area of a rectangle.

Now, we improve it by using the **input** and **output** functions to :

- let the user **enter the value of the length and the width**
- **display the calculated area** in the screen

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

rect_area.m

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

length =   input('Please enter the length: ');
width  =   input('Please enter the width: ');

my_area = length * width        % Rectangle area formula

% print the result
fprintf('The area of a rectangle with length %.2f and width ...
%.2f is %.2f \n', length , width , my_area )
```

# 2. Script with inpu

In our first script, we have created a program that calculates the area of a rectangle.

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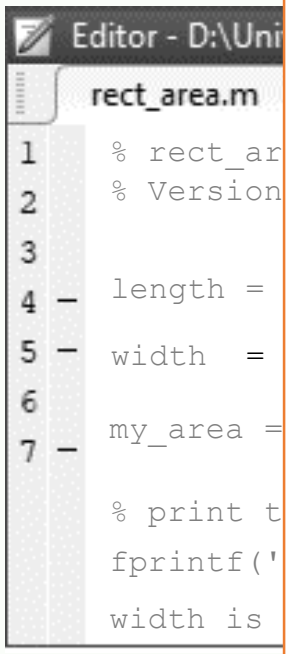
- let the user **enter the value of the length and the width**
- **display the calculated area** in the screen




```
>> rect_area
Please enter the length:  5.23
Please enter the width:  3.4
The area of a rectangle with length 5.23 and width
3.40 is 17.78
>>
```

# Practice