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# Course N°07
# Function file
# in MATLAB


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## 1.Definition

Functions are useful when a certain part of the code must be repeated many times or if we want make into a basic tool available for future use.

This section covers the following points concerning a function M-file; how to :

- ✓ Open or create a function
- ✓ Write a name of this function in MATLAB
- ✓ Select a folder to save the function in MATLAB
- ✓ Write commands and operations in function
- ✓ Run a function and display the result

## 2.Syntax

Functions in MATLAB are stored in separate files. Unless specifically declared as global, all variables are local, which means that they are valid only within that function. Think about a function as a 'watertight' piece of code. Its communication with the outside world are the input and the output variables.

The formal syntax for a function definition is :

```
function [list_of_output_arguments] = function_name(list_of_input_arguments)
or
function [y1,y2,...,yn] = function_name(x1,x2,...,xn)
h % y1,y2,....,yn are the function's output variables
e % x1,x2,....,xn are the function's input variables
l %
p %
```

## 3.Naming

A call to a function will look for a file with the function's name in the MATLAB path. Therefore, it makes sense to set the file name and the function name to be the same. For example, if your function is called draw_trapeze but the file is named trapeze.m, MATLAB will not accept a call to draw_trapeze. It will, however, accept a call to trapeze.m, and will subsequently run file trapeze regardless of the name you have specified as the function declaration within the file (draw_trapeze).

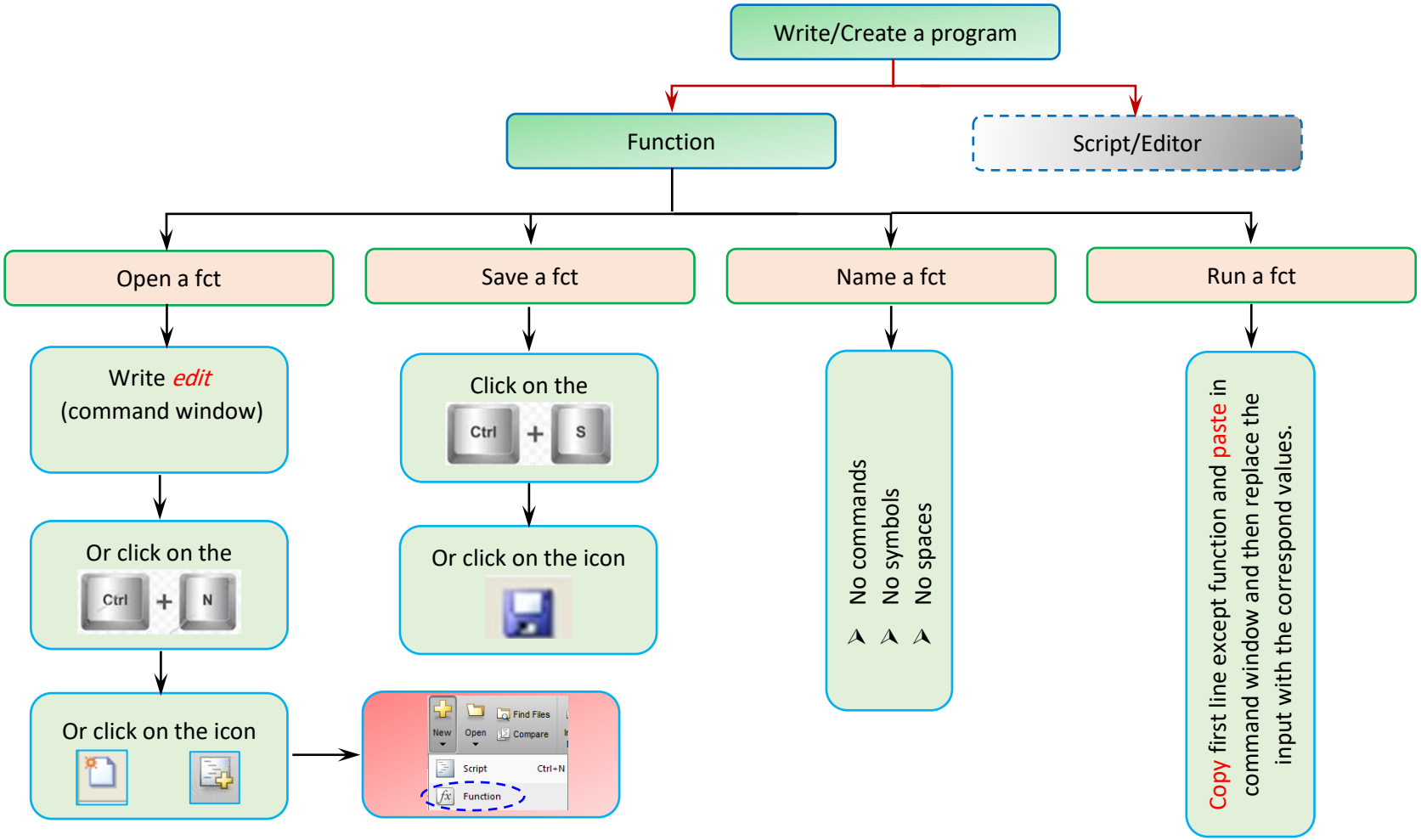


Fig 1. Summarizes the steps for writing a function in MATLAB

Some raccourci in keyboard

| Raccourci clavier | Action |
|---|---|
| Ctrl + F | Recherche par mot clé (page Word, pdf, web...) |
| Ctrl + A | Sélectionne tous les éléments d'une page, d'un dossier. |
| Ctrl + Z | Annule la dernière action (si on le fait plusieurs fois, on annule plusieurs actions à rebours.) |
| Ctrl + X | Coupe un élément sélectionné (texte ou fichier) |
| Ctrl + C | Copie un élément sélectionné (texte ou fichier) |
| Ctrl + V | Colle l'élément que l'on vient de copier. |
| Ctrl + roulette de la souris | Zoome ou « dézoome » l'écran en cours. |
| Ctrl + clic gauche souris | Permet de sélectionner uniquement les objets que l'on clique donc non forcément contigus : mots fichiers |
| D'autres raccourcis qui peuvent servir... | |
| Ctrl + B | Mettre le texte sélectionné en Gras |
| Ctrl + E | Centrer le texte sélectionné |
| Ctrl + I | Mettre en italique le texte sélectionné |
| Ctrl + U | Souligner le texte sélectionné |
| Ctrl + P | Ouvrir la fenêtre pour imprimer |
| Ctrl + S | Enregistrer le document en cours |

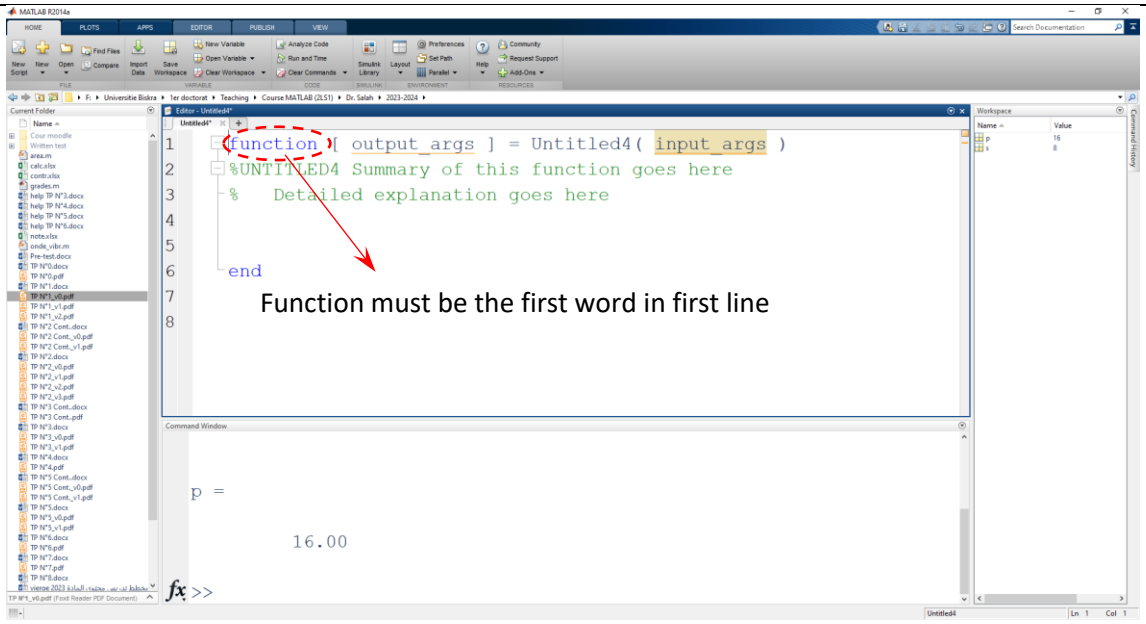


Fig 2. Syntax of a function in MATLAB

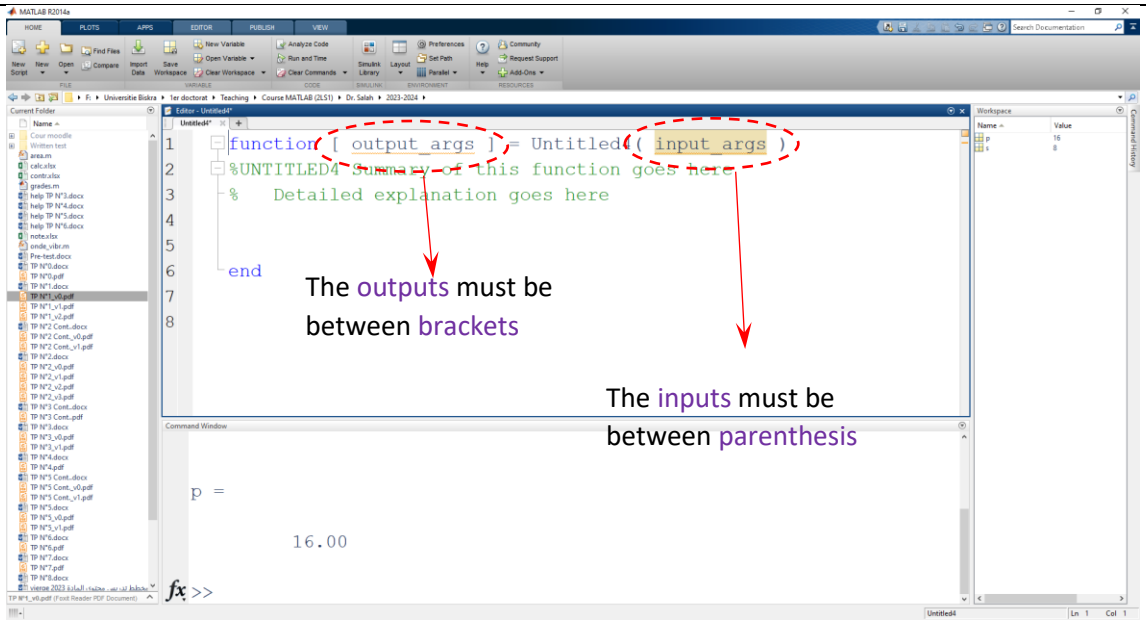


Fig 3. The inputs and outputs of a function in MATLAB

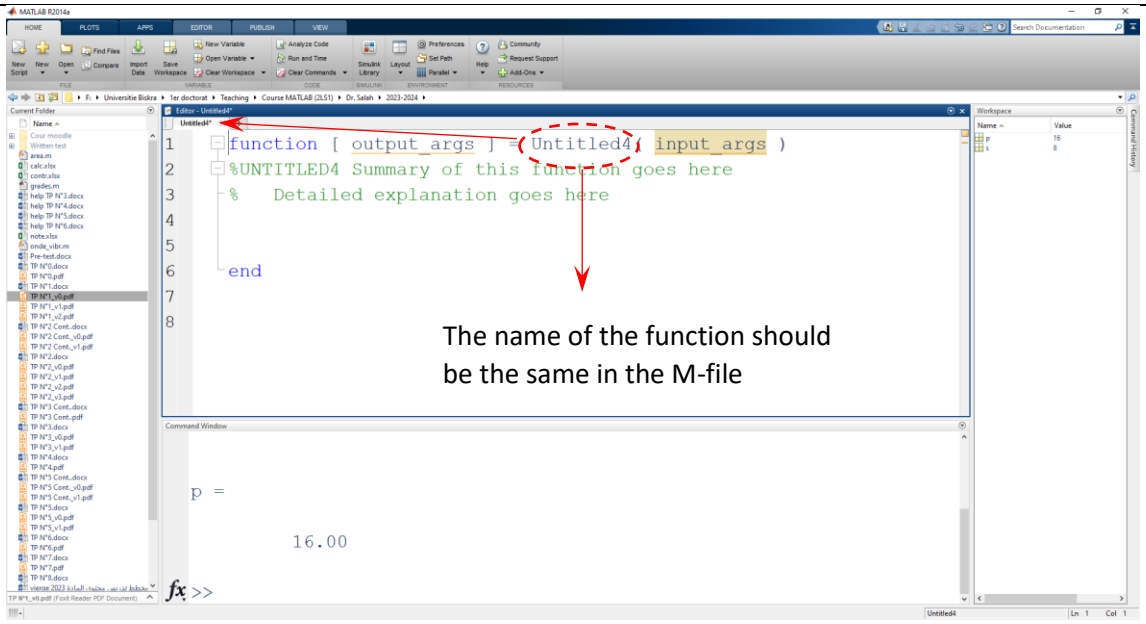


Fig 4. Write the name of the function

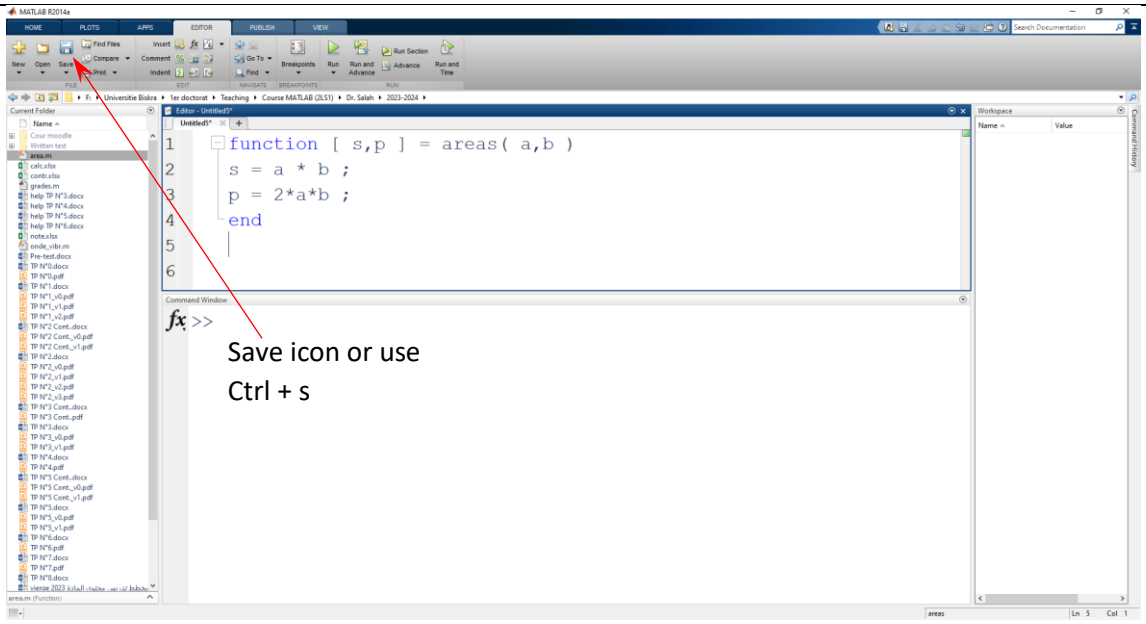


Fig 5. Save icon in function MATLAB

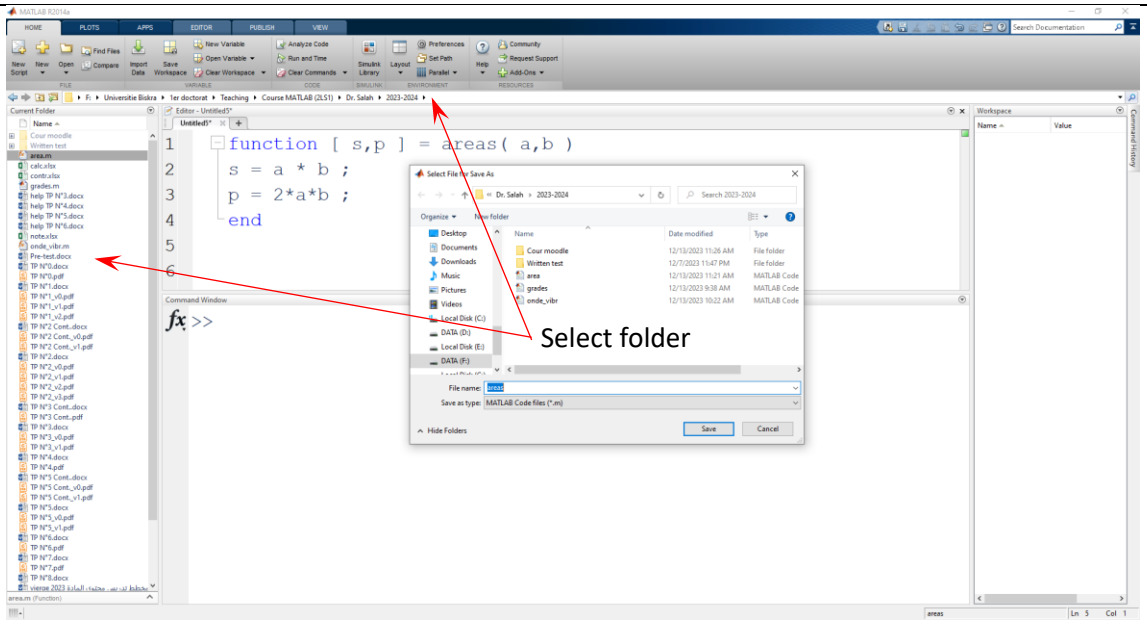


Fig 6. Select folder of the function in MATLAB

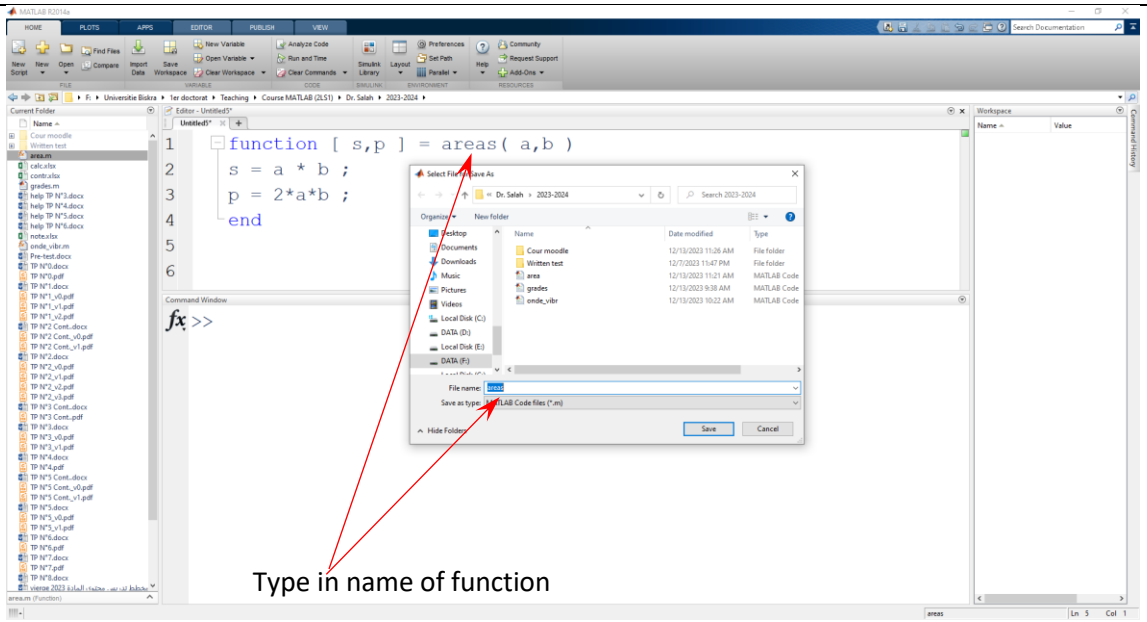


Fig 7. Type in the name of the function in the file name of dialog box

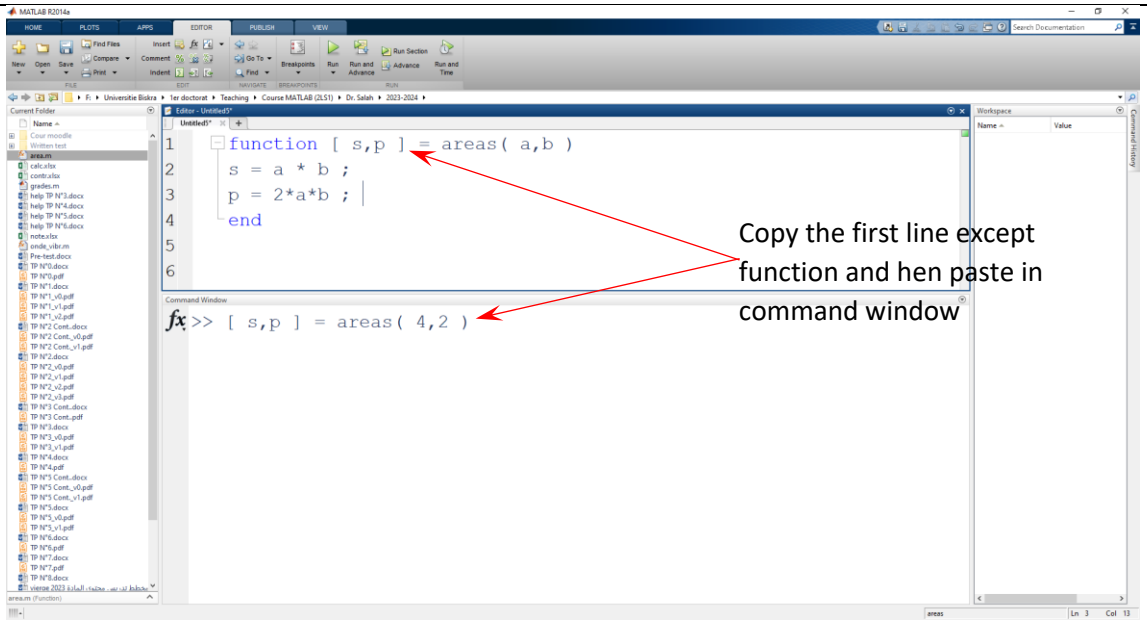


Fig 8. Run or execute the function file in MATLAB

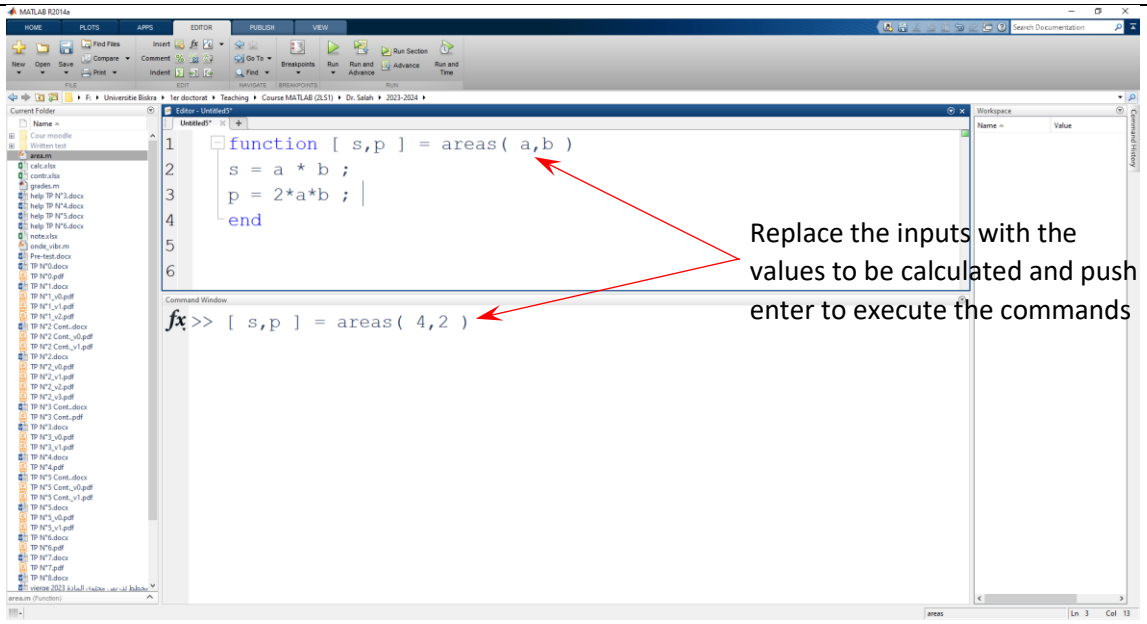


Fig 9. Run or execute the function file in MATLAB

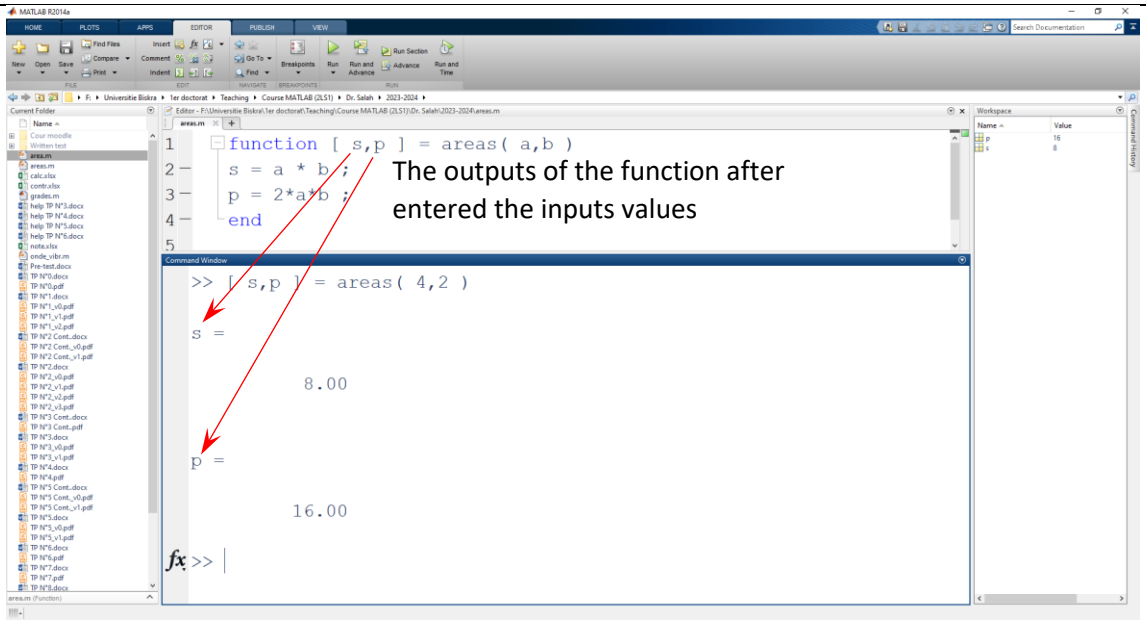


Fig 10. The result after execute the function file in MATLAB

*Note.*

- MATLAB has a template for writing a function M-file.
- The first executable statement in the function file must start with the word function.
- If the function has more than one output value, then the output variables must be in brackets.
- If there is only one output value, then no brackets are necessary.
- If there are no output values, use empty brackets.
- The input and output arguments in the function may be either scalar, vectors, and matrices.

## 4.List of References

*Kattan, Peter Issa. Matlab for Beginners: A gentle approach. Petra books, 2008.*

*Etter, Delores M., David C. Kuncicky, and Douglas W. Hull. Introduction to MATLAB. Vol.4. Hoboken, NJ, USA: Prentice Hall, 2002.*

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