

Introduction to Programming
Tirgul 1 – Introduction to MATLAB

A. Getting started

Open the MATLAB program on your computer. The MATLAB window is divided to several sub-windows. We will work with the following sub-windows: command window, workspace, command history, current folder.

If any of these windows do not appear on your screen you can go to MATLAB toolbar (at the top of the window), choose 'Layout' and do one of the following:

1. Mark (add a tick) the missing desired sub-window/s from the list.
2. Go to 'Layout' and choose "Default".

B. Basic mathematical operations

Type the following calculations in the "command window" (Press "Enter" after each calculation to get its result – it will be presented on the command window):

- After each calculation look at the workspace and at the command history – what happens in each of them?
- Can you tell what is the 'ans' variable appearing in the workspace?
 - I. $9-2$
 - II. $101+22$
 - III. $-3*5$
 - IV. 4^2 (typed as: 4^2)

C. Creating and using variables

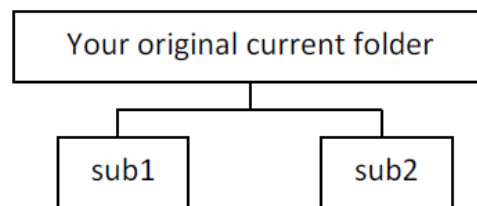
1. Type in the command window: $X = 3$ (and press Enter).
 - Look at the result in the command window and look at the workspace.
2. Type in the command window the following calculations and look at the results:
 - a. $X+5$
 - b. $X*8$
3. Now create the new variable 'Y' by typing: $Y = X+2$. Look at the workspace to see both variables.
4. Make the following calculations:
 - a. $X+Y$
 - b. $2*X+Y$
 - c. Y^X
5. Now change the value of X by typing in the command window: $X = 5$.
 - What is now the value of Y? (You can know by looking at the workspace or by typing 'Y' and pressing enter in the command window).

D. Clearing the screen and the variables

1. Type in the command window: `clc` (and press 'enter'). What happened in the command window? What happened to the workspace? What is the value of the X and Y variables?
2. Type in the command window: `clear` (and press 'enter'). What happened in the command window? What happened to the workspace? What is the value of the X and Y variables?

E. Current folder (directory)

1. First, create a new directory on the computer to serve as your "working directory". Do this by going to "My Computer" (an icon should appear on the computer's desktop), choosing the local disk and creating a new folder in it.
 - You can choose any name you want, as long as you make sure it contains English letters (and not Hebrew) and that the first character in the directory name is a letter and not a number.
2. Now go back to MATLAB. The 'current folder' appears in the toolbar (at the top of screen).
 - What is the current folder?
 - Look at the "Current Folder" sub-window in MATLAB. What does it contain?
3. Now change the current folder. Press the open folder icon next to the current folder display in the toolbar. This will open a windows browser in which you can navigate and choose your desired working directory (in this case, the directory you created in step 1).
4. After changing the current folder look again at the current folder display in the toolbar and on the current folder window – what does it contain now?
5. Press the upside-down triangle icon next to the current folder display – what does the list contain?
6. Use the mkdir command to create the following directories tree:



(You can use the cd command to navigate between the directories).

7. Change the current folder to 'sub1', by using the cd command.
8. Use the rmdir command to remove the directory 'sub2'.
9. At the end make sure you return to your original current directory (without deleting the directories that you created).

F. Scripts

- Before running your script, clear the command window ('clc') and all the variables ('clear').
1. Open the MATLAB **files editor**, and create a new script called 'tirgul1'.
 - Look at the 'current folder' window – can you see your new file?
 2. Now, write the following commands in your script (in the files editor):
 - `myX=2` (this create the variable 'myX' and assign the value 2 to it).
 - `myY = 3*myX+5`
 - `myZ = myY^2 - 2`
 3. Look at the workspace – can you see the variables?
 4. Now run the script and look at workspace again – what variables were created and what are their values?
 5. Now change the first line of your script to assign a new value to the variable 'myX' (e.g., `myX=4`, but you can choose any other number you like).

- Look at the workspace - what is the value of the variables before and after you run your script?
7. Clear the variables. Add a '%' sign at the beginning of the last line in your script (`% myZ = myY^2 - 2`) – the line should change color to green. Save and run the script – what variables were created and what are their values?
 8. Clear the variables. Remove the '%' sign from the last line and add a '%' sign at the beginning of the second line in your script (`% myY = 3*myX+5`). Save and run the script – what happens this time?