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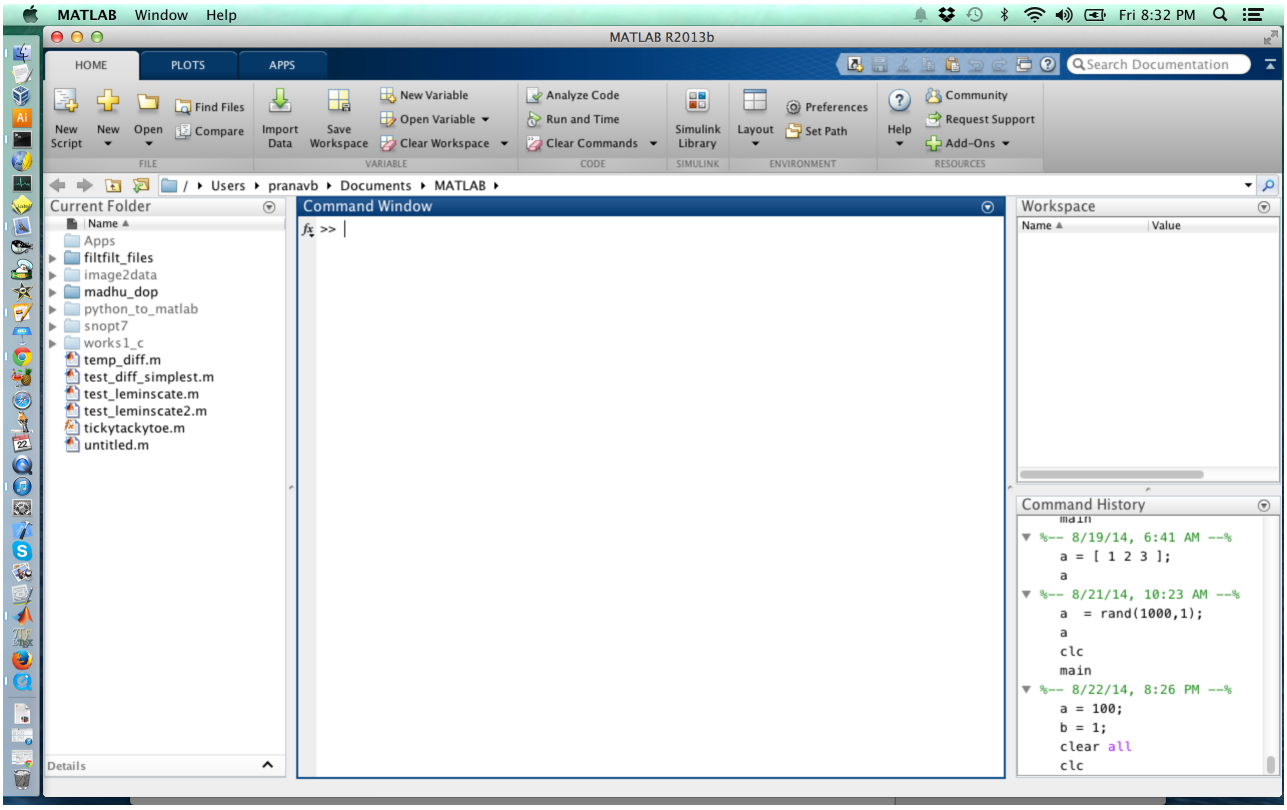
MATLAB Scripts using editor to write functions.

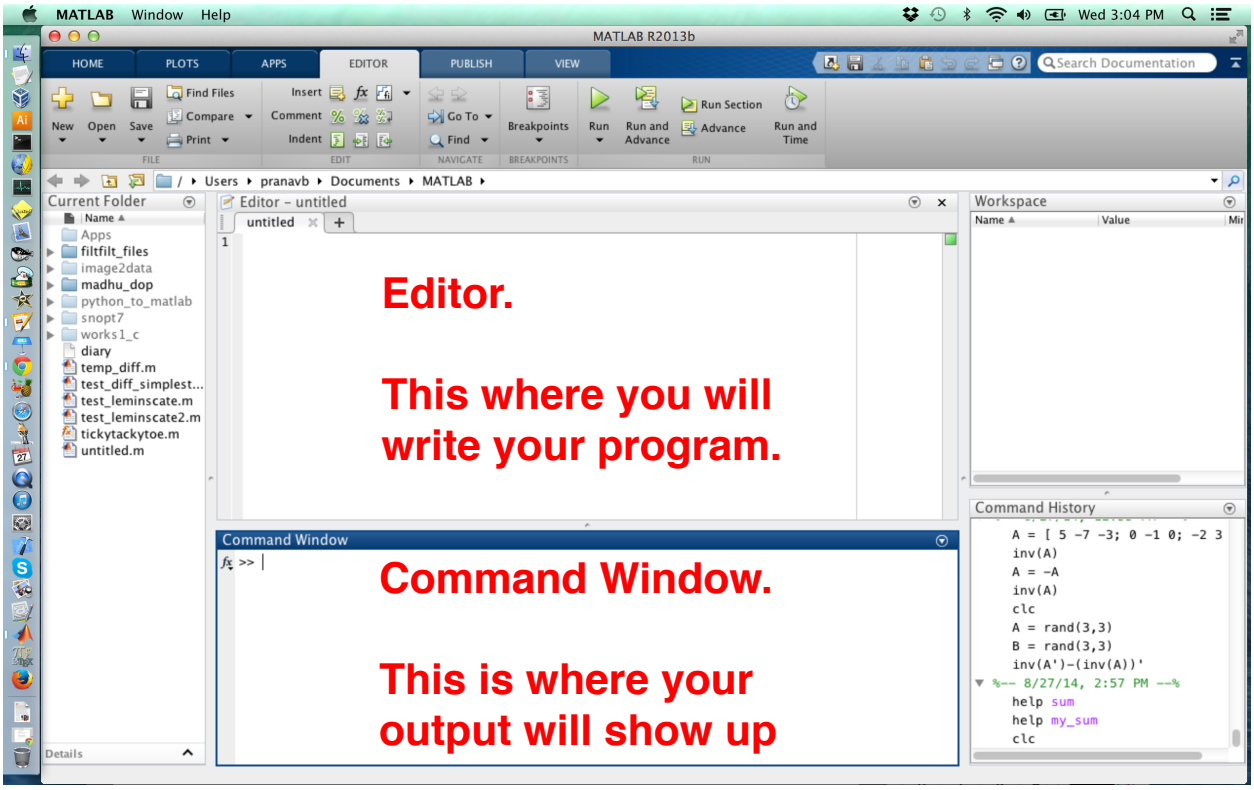
1. Start MATLAB by navigating through your installed application or click the short cut icon for MATLAB shown next.

2. You will see the following screen once MATLAB loads up.



If you don't see something like that above, then go to Layout > Default Layout.

3. We will write a script file. To do this go to New > Script file. Now your MATLAB window will look something like this.



4. In the Editor type the following or copy-paste the code below

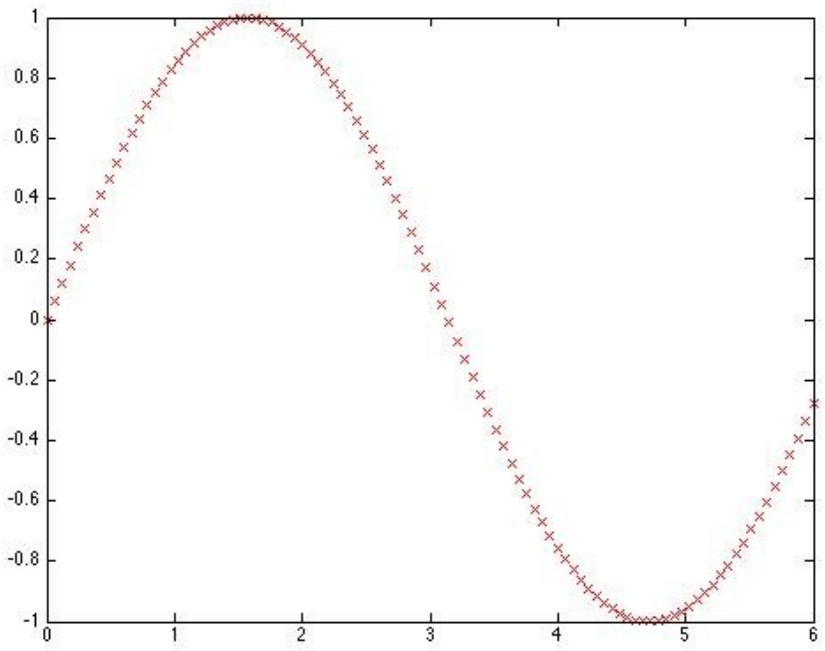
%%%%%%%% Copy paste the code below %%%%%%%%

```
clc %clear screen
clear all %clear all workspace variables.
close all %Close all figures.
x = linspace(0,6,100); %Generate values of x linearly space in the interval 0 to 6.
y = sin(x); %Generate values of y
plot(x,y,'rx'); %Generate a plot
```

%%%%%%% Code ends here %%%%%%%%%%%%%%%%%%

Now do Save -> test1.m
Next do Run (this will run the code)

If everything worked fine then you will see the following figure displayed in MATLAB



A couple of things about the code above.
The % denotes a comment. Everything after the % is ignored by MATLAB.
From the comments you will be able to understand what each command does.

For more information you can also type in the Command Window
help plot
help clc

This file test1.m is called a script. The good part of a making a script is that your code is saved and it is easy to make changes.

For e.g. if you want to plot equation of a parabola y = x^2 then replace the line
y = cos(x) with y = x.^2 (Question why x.^2 and not x^2? Trying running your code with x^2 to see what happens).

5. Our next problem is to find the sum of elements in a matrix.
For e.g. a = [1 1 3 4]; The output of the program should say 9 (=1+1+3+4).

Open a new file by doing New > Script file

Type the following in the script file

%%%%%%%% Copy paste the code below %%%%%%%%
clc %clear the screen
clear all %clear all variables in the memory
a = [1 1 3 4]; %semi-colon suppresses the output.

total_sum = 0; %this variable will save the running sum.

for i=1:length(a) %for loop, length(a) gives the number of elements in a which is 4.
    total_sum = total_sum + a(i); %this command maintains a running sum of all variables.
end %this tells MATLAB that for loop has now ended.

disp(total_sum) %this displays the sum. You could also write simply total_sum

%%%%%%% Code ends here %%%%%%%%%%%%%%%%%

Now save the file. Save As > test.m
Run the file. Run

You should see the output in the Command Window. It should be 9.

Play with the matrix. Try a =[1 2 3 6 3 2 3]; or anything of your choice and see the output

6. Now what if you have to find the sum of elements of multiple matrices of different sizes. For e.g.

```
a = [1 1 3 4];
b = [6 5 7 ];
c = [10 1 5 6 7];
```

One option is to run the above code multiple times with the above matrices. A better way is to write a function that does this. This gets us to writing functions as a script.

Open a new script file New > Script file and copy paste the code below.

%%%%%%%% Copy paste the code below %%%%%%%%

```
function total_sum = my_sum(a) %the function name is my_sum. The input is a. The output is total_sum.

total_sum = 0; %this variable will save the running sum.

for i=1:length(a) %for loop, length(a) gives the number of elements in a which is 4.
        total_sum = total_sum + a(i); %this command maintains a running sum of all variables.
end %this tells MATLAB that for loop has now ended.
```

%%%%%%% Code ends here %%%%%%%%%%%%%%%%

Next save the code.
Note that MATLAB calls the function my_sum. Save this file.

The above function has to be called from another script file. We will define that next.

Open a new script file New > Script

%%%%%%%% Copy paste the code below %%%%%%%%

```
a = [1 1 3 4];
b = [6 5 7 ];
c = [10 1 5 6 7];

sum_a = my_sum(a);
sum_b = my_sum(b);
sum_c = my_sum(c);

disp(sum_a)
disp(sum_b)
disp(sum_c)
```

%%%%%%% Code ends here %%%%%%%%%%%%%%%%

Run the file by going to Run

If everything worked fine the output should be.
9
18
29

7. Now MATLAB has written some basic functions for you. Like the above function my_sum has already been written in MATLAB and you do not have to re-write it.

Before you write a function you should check the documentation online or by typing help sum

You can get the same result by doing the following in the Command Window.
a = [1 1 3 4];
sum(a)

The answer would be 9 and so on.