

## Summer Training I MATLAB for Engineers



Benha University

Computer Systems Engineering Electrical Engineering Department Faculty of Engineering (at Shoubra)

# Lab 04

### **Getting Started**

- 1. Start MATLAB
- 2. On the HOME tab, in the ENVIRONMENT section, click 🗔 Layout, then 🔲 Default.<sup>1</sup>

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New Script	New	Open	G Find Files	Import Data	Save Workspace	Image: New Variable         Image: Open Variable	Analyze Code	Layout	<ul> <li>Ø Preferences</li> <li>Bet Path</li> <li>Parallel ▼</li> </ul>	? Help	🏝 Community 🖻 Request Support 🕂 Add-Ons ▼
		FILE			V.	ARIABLE	CODE	E	NVIRONMENT		RESOURCES

3. Consider the Current Folder window, right click, New File, Function.

urrent Folder 💿	Command Window					
🗋 Name 🛆	(1) New to MATLAB? Watch this <u>Video</u> , see <u>Examples</u> , or read <u>Getting Started</u> .					
New Folder	-					
New File	•	Script				
Compare Selected Files/Folders		Function				
Compare Against	•	Example				
Source Control		Class				
	Carlos	Zip File				
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#### **User Defined Functions**

Define a function average in a file named average.m that accepts an input vector, calculates the average of the values, and returns a single result. Call the function from the command line to calculate the average of z = [1,2,3,4,.....,99].

function [ ave ] = average( X )
<u>end</u>

<sup>1</sup> You may like to try other Layout options.



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5. Define a function min\_max in a file named min\_max.m that returns the minimum and the maximum values of an input vector. Call the function from the command line to find the minimum and maximum of values = [12.7, 45.4, 98.9, 26.6, 53.1]



6. There are 39.37 inches in a meter, 12 inches in a foot, and 3 feet in a yard. Write a function meter2yard to input a length in meters (which may have a decimal part) and convert it to yards, feet, and inches. (Check: 3.51 m converts to 3 yds, 2 ft, 6.19 in.)

<u>function</u>\_\_\_\_\_\_



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### Plot

7. Try the following code snippets:

```
a)
```

```
>> clear; clc; close;
>> x = -pi:0.01:pi;
>> y = cos(x);
>> plot(x,y)
```

b)

```
>> clear; clc; close;
>> x = 1:0.1:2*pi;
>> y = sin(x);
>> plot(x,y)
```

c)

```
>> clear; clc; close;
>> x = -pi:0.01:pi;
>> y = cos(x);
>> plot(x,y)
>> xlabel('x');
>> ylabel('cos(x)');
>> title('Graph of cosine fron -\pi to \pi')
```

d)

```
\gg clear; clc; close;
```

```
≫ x=-pi:pi/100:pi;
```

```
\gg y=sin(x);
```

```
\gg plot(x,y)
```

```
≫ axis([-pi pi -1 1])
```

```
\gg xlabel('x')
```

```
\gg ylabel('sin(x)')
```

```
\gg title('Graph the sine function')
```

 $\gg$  text(1,-1/3,' Note the odd symmetry ')