

## 10-Script Files

text: Chapter 4.1-4.2

ECEGR 101  
Engineering Problem Solving with Matlab  
Professor Henry Louie



## Overview

- Scripts
- Editor Window
- Writing Commands
- Running the Script
- Global Variables
- Input to Scripts



## Script File

- Script file = program = **sequence of MATLAB commands**
- Instead of typing the commands in the Command Window, we can **save** them in a script file.
- Entire script file can be executed by typing its name in the Command Window.
- Script files are also called **M-files (.m)**.

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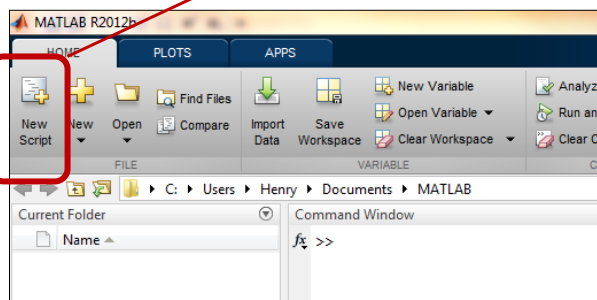
3



## Editor Window

Script files are written in the Editor Window

Click here to open the Editor Window.



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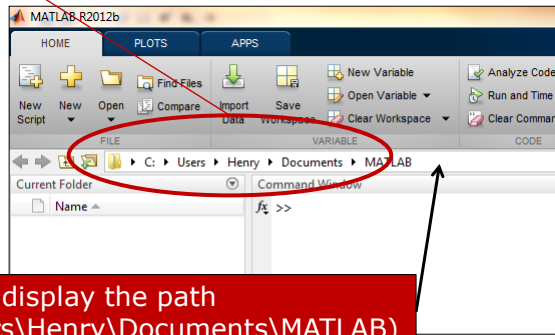
4





## Current Directory

To run the script, it has to be in the **current directory**.



Click here to display the path  
(e.g. C:\Users\Henry\Documents\MATLAB)



## Current Directory

Helpful functions to manage directory:

- cd (changes directory)
- ls (lists all files in current directory)
- pwd (shows current directory)



## Running the Script

Type the file name in the Command Window:

```
Command Window
>> rad2deg
angle_rad =
Columns 1 through 7
    0    0.41888    1.2566    1.6755    2.0944    2.5133
Columns 8 through 14
    2.9322    3.351    3.7699    4.1888    4.6077    5.0265    5.4454
Columns 15 through 16
    5.8643    6.2832
angle_deg =
Columns 1 through 7
    0    24    48    72    96    120    144
Columns 8 through 14
    168    192    216    240    264    288    312
Columns 15 through 16
    336    360
```

Make sure to save all changes before running!



## Running the Script

Editor - C:\Users\Henry\Google Drive\10113\_FQ\Lectures\rad2deg.m

EDITOR PUBLISH VIEW

Find Files Insert Comment Go To Breakpoints Run Run and Run and Run Section  
New Open Save Compare Indent Find Breakpoints Run and Run and Run and Advance  
FILE EDIT NAVIGATE BREAKPOINTS RUN

```
rad2deg.m
1 %%Example
2 - close all
3 - clear all
4 - clc
5 - angle_rad=linspace(0,2*pi,16)
6 - angle_deg=angle_rad*180/pi
```

or click "Run" in the Editor window, or press F5



## Running the Script

- A script will not run unless it is in the current directory OR it is in Matlab's path
- Only commonly used scripts should be placed in the path

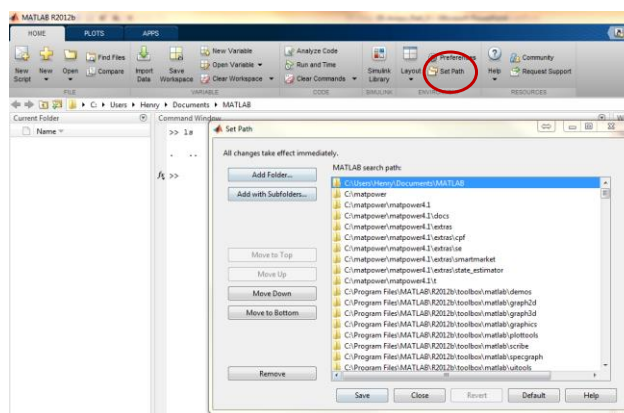
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11



## Search Path

A new directory can be added to the search path using the Set Path menu.



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12



## Global Variables

- Script files share the Command Window's workspace
  - Any variables defined before the script file starts are visible to the script file.
  - Any variables created by the script file remain in the workspace after the script file finishes executing.
  - Script files can communicate with other script files through the data left behind in the workspace.



## Global Variables

- After running "rad2deg" the workspace shows angle\_deg and angle\_rad as variables

```

Command Window
angle_rad =
  Columns 1 through 13
    0    0.4189    0.8378    1.2566    1.6755    2.0944    2.5133    2.9322
  Columns 14 through 16
    5.4454    5.8643    6.2832
angle_deg =
  Columns 1 through 13
    0    24.0000    48.0000    72.0000    96.0000    120.0000    144.0000    168.0000
  Columns 14 through 16
    312.0000    336.0000    360.0000
>> who

Your variables are:

angle_deg  angle_rad
  
```



## Input to a Script File

There are three ways of initializing variables when working with script files:

1. Initialize (create) the variable in the script file
2. Initialize the variable in the Command Window
3. Get a user input when the script is executed (the `input` function)



## Input to a Script File: Method 1

1. Initialize the variable in the script file.

```

Editor - Untitled2*
EDITOR PUBLISH VIEW
+ Find Files Insert fx fn
New Open Save Compare Comment % Go To Breakp
Print Indent Find Breakp
FILE EDIT NAVIGATE BREAKP

Untitled2* x
1 %%Example
2 close all
3 clear all
4 clc
5 angle_rad=linspace(0,2*pi,16)
6 angle_deg=angle_rad*180/pi
  
```





## Input to a Script File: Method 2

- Initialize the variable in the Command Window.

Initialized in command window

Running the script

```
rad2deg.m
%%Example
angle_deg=angle_rad*180/pi
```

```
Command Window
>> angle_rad = linspace(0, 2*pi, 4)
angle_rad =
    0    2.0944    4.1888    6.2832
>>
>> rad2deg
angle_deg =
    0    120    240    360
>>
```

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17



## Input to a Script File: Method 3

- Initialize the variable with a user input.

```
rad2deg.m
1 %%Example
2 - close all
3 - clear all
4 - clc
5 - angle_rad=input('Enter an angle in radians: ');
6 - angle_deg=angle_rad*180/pi
```

Note the extra space before ```.  
It is not necessary, but it is a nice touch

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18



## Input to a Script File: Method 3

### Command Window


```
>> rad2deg
Enter an angle in radians: pi
angle_deg =
    180
>>
>> rad2deg
Enter an angle in radians: pi/3
angle_deg =
     60
>>
>> rad2deg
Enter an angle in radians: 2*pi/3
angle_deg =
    120
>>
```

```
>> rad2deg
Enter an angle in radians: [pi pi/2 pi/4 pi/8]
angle_deg =
    180     90     45    22.5
>>
>> rad2deg
Enter an angle in radians: [pi/6 pi/12]
angle_deg =
     30     15
```



## Exercise

Write a script (save your program in an m-file) to calculate gas consumption. It should first ask the user for the **distance** traveled (in **miles**) and the amount of **gas** used (in **gallons**). Then, your program should compute the **consumption** in **miles per gallon** as well as in **gallons per mile**.



Editor - C:\Users\vagnieszka\Documents\ECEGR 101\LECTURES\CHAPTER 4\exercise1.m


File Edit Text Go Cell Tools Debug Desktop Window Help

```

1 % Exercise 1
2 % Calculate gas consumption
3
4 % Ask the user for input
5 -
6 - distance = input('Enter the distance in miles\n');
7 - gallons = input('How many gallons were used?\n');
8
9 % Calculate miles per gallon
10 - milesPERgallon = distance/gallons
11
12 % Calculate gallons per mile
13 - gallonsPERmile = gallons/distance
14

```

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## Exercise

Command Window

```

Enter the distance in miles
600
How many gallons were used?
10
milesPERgallon =
    60
gallonsPERmile =
    0.0167
>>
>>

```

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## Exercise

Write a script file to calculate the circumference and area of a circle given its radius:

$$C = 2\pi r$$

$$A = \pi r^2$$

The program should ask the user to enter the value of r and then compute C and A. Save your program in a new script file.



## Exercise

```
r = input('enter the radius of the circle: '); %radius
c = 2*pi*r
a = pi*r^2
```

Saved in a file  
named circle.m

```
>> circle
enter the radius of the circle: 100
c =
  628.3185
a =
  3.1416e+004
>>
```



## Exercise

```
>> circle
enter the radius of the circle: [100 120]
c =
 628.3185 753.9822
```

??? Error using ==> mpower  
Matrix must be square.

```
Error in ==> circle at 3
a = pi*r^2
>>
```

How can the script be modified so we can run it on a vector?



## Exercise

```
r = input('enter the radius of the circle: '); %radius
c = 2*pi*r
a = pi*r.^2
```

```
>> circle
enter the radius of the circle: [100 120]
c =
 628.3185 753.9822
a =
 1.0e+004 *
 3.1416 4.5239
```