

## 1-3 The MATLAB Environment

Fundamental unit of data in MATLAB is the **array**.

### 1. MATLAB Desktop:

- special window called the matlab desktop
- several tools are docked to the desktop
  - Command window
  - toolstrip
  - Documents window
  - Figure windows
  - Workspace Browser
  - Current Folder Browser
  - Help Browser
  - Path Browser
  - Command History Window

### 2. Command Window:

- interactive commands entered by the user at prompt **>**, are immediately executed.

Example

we want to calculate  $A = \pi r^2$ , at matlab prompt we type

$> \text{area} = \text{pi} * 2.5^2$

Annotations:  
-  $\text{pi}$ : predefined 3.141592...  
-  $*$ : multiplication  
-  $2.5$ :  $r$  given = 2.5 m  
-  $^2$ : power

> area =  
19.6350

example

If input is too long, use **ellipsis** and go to next line  
↙ division

> x1 = 1 + 1/2 + 1/3 + 1/4 ...  
+ 1/5 + 1/6 ↗ ellipsis

3. Toolstrip: A bar of tools across the top of the desktop organized into related categories of functions first by tabs & then by groups
4. Command History Window: displays a list of commands that a user has previously entered in the command window. Use mouse clicks to manipulate listed commands.
5. Document Window: used to create/edit m-files. The editor opens with color coded text for writing scripts.

The area calculation can be saved as a script `calc_area.m`

`% script to calculate area`

`radius = 2.5;` ← semicolon to stop echoing

`area = pi * radius^2;`

`string = ['The area of the circle is ', num2str(area)];` ← built-in function

`disp(string)`

← built-in function

6. Figure Windows : are used to display MATLAB graphics

`% plot sin(x) for  $0 \leq x \leq 6$`

`x = 0:0.1:6;` ← generate a range of values

`y = sin(x);`

`plot(x,y);`

## 7. Docking & Undocking of Windows:

Window is docked → appears as pane within the MATLAB desktop

Window is undocked → appears as an independent window on the screen

dock ↔ undock

↗ by clicking on small arrow on top-right-corner

8. MATLAB Workspace: Part of the Computer <sup>memory</sup> where all variables and arrays are stored.

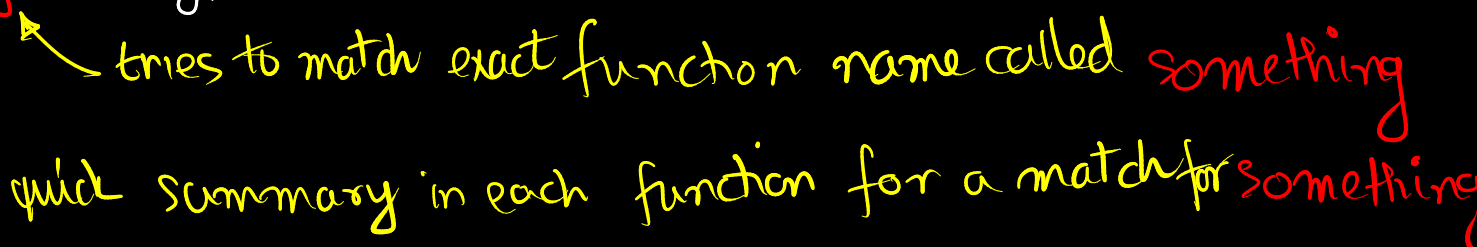
The command **whos** lists all variables & arrays in the current workspace.

The **clear** command deletes a variable from the workspace.  
**clear var** will delete variable var from the workspace.

9. Workspace Browser: GUI based tool providing same information as **whos**.

10. Current Folder Browser: Shows all the files in the currently selected folder. User can select files to edit or execute.

## 11. Getting Help:

- ① Help browser - click on (?) icon or type `doc` or `helpwin`
- ② `help` or `help something` type in command window
- ③ `lookfor something`  tries to match exact function name called `something`  
searches quick summary in each function for a match for `something`

## 12. Important Commands:

- `clc` - clear contents of command window.
- `clf` - clear contents of figure window
- `clear` - clear variables in workspace
- `abort` or `^C` - if M-file starts an infinite loop that needs to be stopped.
- `tab` - auto complete feature
- `!` - sends command to operating system

`diary diary filename` - all inputs & outputs in the command window are echoed to `diary filename`

`diary off` - suspends input to `diary filename`

`diary on` - resumes input to `diary filename`

### 13. MATLAB search path:

Search sequence

- 1 variable
- 2 M-file in current directory
- 3 M-file in search path

Don't name your variable or functions same as standard MATLAB function, the MATLAB function becomes inaccessible

`addpath` - add directory to MATLAB search path

`path` - display MATLAB search path

`savepath` - save entire current path to `pathdef.m`

`rmpath` - remove directory from MATLAB search path

`which functionname` - which version of the file is being executed and where is it located.