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 :
   - interative commands entered by the user at prompt >, are immediately executed.

Example

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

r given = 2.5 m

multiplation

power

```
> area = pi * 2.5 ^ 2
```

↑ predefined 3.141 592...

```
> 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 be 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;
area = pi*radius^2;
string = ['The area of the circle is ', num2str(area)];
disp(string)
```

% Comment

; semicolon to stop echoing

num2str built-in function

disp built-in function

6. Figure Windows : are used to display MATLAB graphics

```
% plot sin(x) for 0 <= x <= 6
x = 0:0.1:6;
y = sin(x);
plot(x,y);
```

0:0.1:6 generate a range of values

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 memory 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` – searches quick summary in each function for a match for something

↖ tries to match exact function name called something

12. Important Commands:

`clc` – clear contents of Command window.

`clf` – clear contents of figure window

`clear` – clear variables in workplace

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

2 M-file in current directory

3 M-file in search path

addpath — add directory to MATLAB search path

path — display MATLAB search path

savepath — search 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.