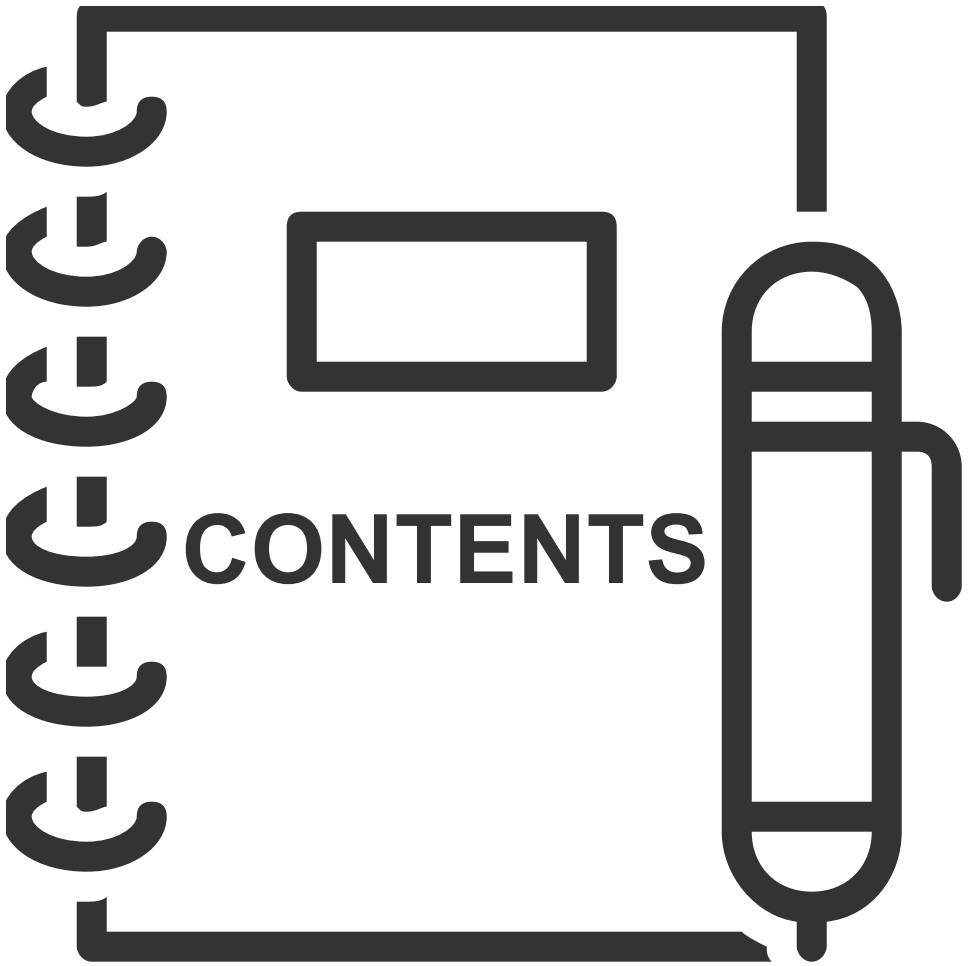
SVKM'S NMIMS Deemed to be UNIVERSITY | NAVI MUMBAI

MATLAB
Unit 2-Lecture 1

BTech (CSBS) -Semester VII

12 July 2022, 09:35AM

*few figures/content have been prepared/referred from internet source/books



- Teaching plan
- Assessment analysis
- Text/Reference books
- Unit 1-Lecture 1

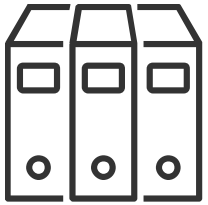
Teaching plan/Assessment analysis

Teaching plan

Teaching Scheme				Evaluation Scheme	
Lecture (Hours/week)	**Practical (Hours/week)**	**Tutorial (Hours/week)**	**Credit**	**Internal Continuous Assessment (ICA) As per Institute Norms (50 Marks)**	**Theory (3 Hrs, 100 Marks)**
2	2	0	3	Marks Scaled to 50	Marks Scaled to 50

Assessment analysis

Assessment Component	**ICA (100 Marks) (Marks scaled to 50)**					**TEE (100 marks) (Marks scaled to 50)**
	Lab Performance	**Lab Exam and Viva**	**Research activity (beyond syllabus)**	**Class Test 1 and Class Test 2**	**Class Partition**	
Weightage	10%	5%	10%	20%	5%	50%
Marks	20	10	20	20+20	10	100
Date/week of activity	Weekly	10^{th} and 11^{th}week	14^{th} week	T1: 16-23 August, 2022 T2: 10-15 October, 2022	2^{nd} and 13^{th} Week	16^{th} Nov.2022 to 2^{nd} Dec., 2022



Text/Reference books

Text Books:

1) Rafael C. Gonzalez, Richard E. Woods, Steven Eddins, "*Digital Image Processing using MATLAB*", Pearson Education, Inc., Second Edition, 2004.
2) Stormy Attaway, Butterworth-Heinemann, "*MATLAB: A Practical Introduction to Programming and Problem Solving*", Butterworth-Heinemann is an imprint of Elsevier, Fourth Edition, 2017.

Reference Books:

1) Clever Moler, *"Experiments with Matlab"*, MathWorks, Inc., 2011.

Unit 1-Lecture 1→Agenda

1) Desktop Basics
2) Numbers &Arithmetic Operations
3) Workspace Variables

1: Introduction

When you start MATLAB, the desktop appears in its default layout.

- The desktop includes these panels:
- **Current Folder** — Access your files.
- **Command Window** — Enter commands at the command line, indicated by the prompt (>>).
- **Workspace** — Explore data that you create or import from files.
- **Command History** — View or rerun commands that you entered at the command line.

Command Window

- type commands

Current Directory

- View folders and m-files

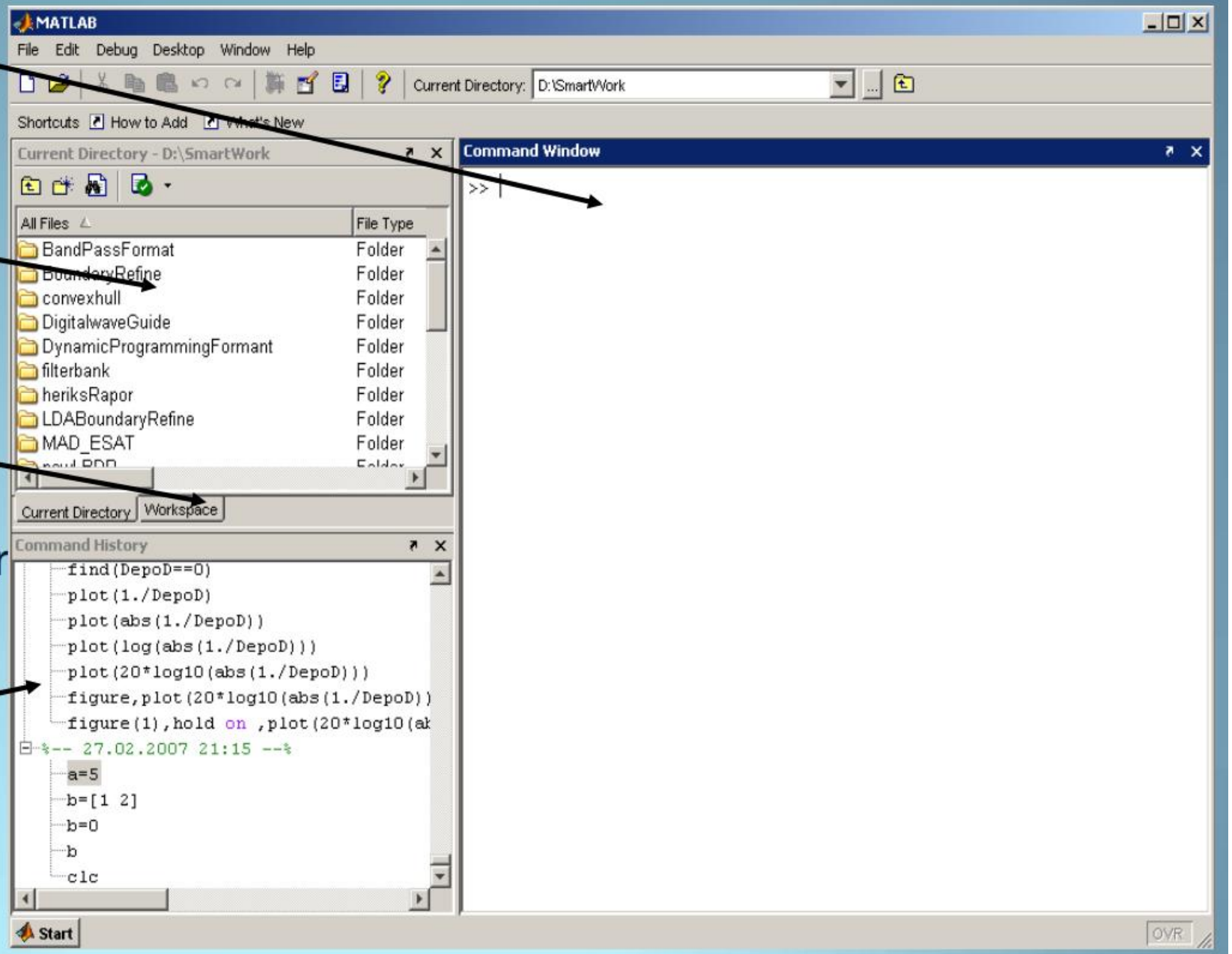
Workspace

- View program variables
- Double click on a variable
- to see it in the Array Editor

Command History

- view past commands
- save a whole session

using diary



MATLAB window

- Figure Window -contains output from graphic commands
- Help Window -provides help information
- Editor Window -creates and debugs script and function files
- Current directory Window -shows files in current directory
- Launch Pad Window -provides access to tools,demos and documentation

Command window

>> type code

Press enter

Command executed and output displayed

semicolon (;)

output not displayed

Ellipsis(…) if a command is too long to fit in one line

Command can continue line after line up to 4096 characters.

comman commands

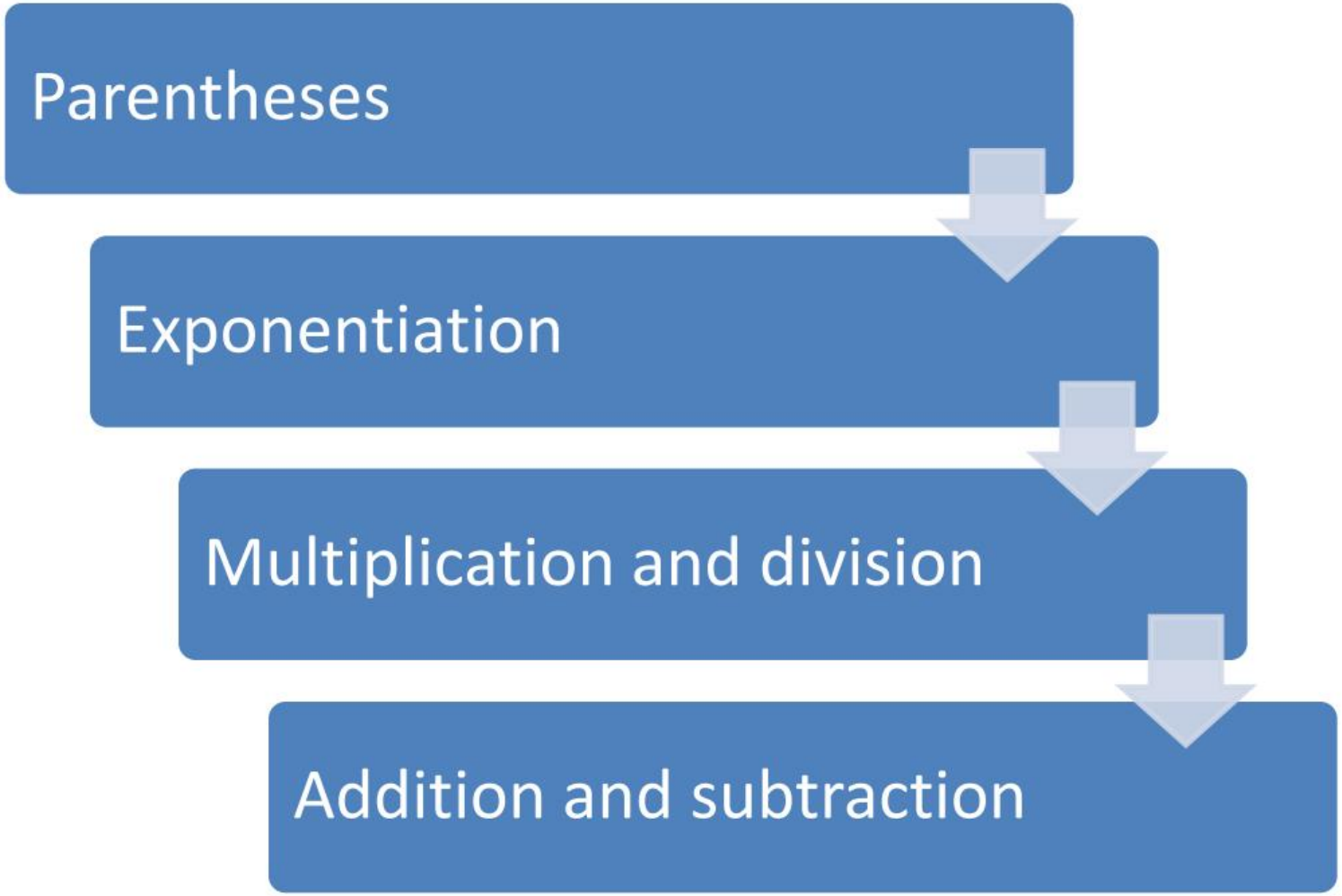
Matlab commands **case sensitive**

%	-comment
clc	-clear screen
↑	-recall previously typed commands
↓	-move down to previously typed

Arithmetic Operations With Scalars

Operation	Symbol	Example
Addition	+	5+3
Subtraction	-	5-3
Multiplication	*	5*3
Right division	/	5/3
Left division	\	5\3=3/5
Exponentiation	^	5^3=125

Order of Precedence



Display Formats

Command	Description
format short	Fixed-point with 4 decimal digits
format long	Fixed-point with 14 decimal digits
format bank	2 decimal digits
format compact	Eliminates empty lines
format loose	Adds empty lines

Elementary Math functions

Function	Description
sqrt (x)	Square root
exp (x)	Exponential (e^x)
abs (x)	Absolute value
log (x)	Natural logarithm Base e logarithm
Log10(x)	Base 10 logarithm
factorial(x)	Factorial function x!

Trigonometric/rounding Math functions

sin(x),cos(x),
tan(x),cot(x)

Rounding function

Function	Description
round(x)	Round to the nearest integer
fix(x)	Round towards zero
ceil(x)	Round towards infinity
floor(x)	Round towards minus infinity
rem(x,y)	Returns remainder after x is divided by y

Trigonometric/rounding Math functions

Elementary functions (sin, cos, sqrt, abs, exp, log10, round)

-type **help elfun**

Advanced functions (bessel, beta, gamma, erf)

-type **help specfun**

-type **help elmat**

Defining scalar variables

variable is a name made of a letter or a combination of several letters that is assigned a numerical value

- actually name of a memory location

-assignment operator “=”

eg. >>x=15

>>x=3*x-12

When new variable is created matlab assigns appropriate memory space where assigned value can be stored

- When variable is used stored data is used
- If assigned new value content of memory is replaced

eg. >>ABB=72;

>>ABB=9;

>>ABB

ABB=

9

Rules about variable names

- Variable names are case sensitive.
- Variable names can contain up to 63 characters (as of MATLAB 6.5 and newer).
- Variable names must start with a letter followed by letters, digits, and underscores.
- Must begin with a letter.
- Avoid using names of built-in functions for variable.