

American International University - Bangladesh

## Experiment No 1

### Title of the Experiment

### Introduction to MATLAB

Student ID : 23-51662-2

Student Name: Poroma Basak

Course Title: Data communication

Section: L

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Subject \_\_\_\_\_

Sat	Sun	Mon	Tue	Wed	Thu	Fri
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Date: . / . / .

Experiment No: Enter 1

Date: 20/10/25

Student ID: 23-51662-2

Name: Paroma Basak

Task 1: Flatten Matrices and Addressing the elements

Solution: a)  $\gg A = [1 \ 2 \ 3 ; 4 \ 5 \ 6 ; 7 \ 8 \ 9]$  result:  $\begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix}$

b)  $\gg D = [1 \ 2 \ 3 \ 4]$  result:  $\begin{bmatrix} 1 & 2 & 3 & 4 \end{bmatrix}$

c)  $\gg D'$

$$\text{result} = \begin{bmatrix} 1 \\ 2 \\ 3 \\ 4 \end{bmatrix}$$

~~20/10~~ d)  $\gg A(1,1) + A(2,2) + A(3,3)$

~~20/10~~ result: 15

e)  $\gg A(:, 2)$  result:  $\begin{bmatrix} 2 \\ 5 \\ 8 \end{bmatrix}$

f)  $\gg A(:, 3) = 3$

g)  $\gg A(2, :)$  result: 9 5 6 -

Task 2: Generating Matrices

a)  $x = \text{linspace}(0, \pi, 101)$

result:  $x = 0 \quad 0.0314 \quad 0.0628 \quad \dots \quad 3.1416$

b)  $\gg x = (0 : 0.01 : \pi)$

result:  $x = 0 \quad 0.0314 \quad 0.0628 \quad \dots, 3.1416$

c)  $\gg v = (10 : -2 : 0)$

result: 10 8 6 4 2 0

d)  $\gg d = \text{rand}(1, 10)$

result: 0.5067 0.9058 0.1270 0.9134 0.0975 0.2785

a)  $0.5469 \quad 0.9575 \quad 0.9649$

Name: Potoma Basale  
ID: 23-51662-2

b)  $\gg R = \text{randn}(10, 10)$

result:

~~$0.6718 \quad 0.8684 \quad 0.1022 \quad 0.0821$~~   
 ~~$0.5377 \quad -1.3499 \quad 0.6715 \quad 0.8889$~~   $= 3.1480$

$2.7694 \quad -1.4172 \quad -0.7873 \quad -1.7115 \quad 1.1093$

c) Task 3: Deleting rows and columns.

a)  $\gg A(2, :) = []$

result  $1 \quad 2 \quad 3$   
 $7 \quad 8 \quad 9$

b)  $R(:, 6:10) = []$

result

$0.5377 \quad -1.3499 \quad 0.6715 \quad 0.8889 \quad -0.1022$

$- \quad - \quad - \quad - \quad -$

$2.7694 \quad 1.4172 \quad -0.7873 \quad -1.7115 \quad 1.1093$

$(10 \times 10) \text{ matrix} = x$

$8.826 \cdot 9 \quad 11.80 \cdot 9 \quad 0 \quad 2.10 \cdot 9$

$19 \cdot (1:10, 1:10) = x$

$8.826 \cdot 9 \quad 11.80 \cdot 9 \quad 0 \quad 2.10 \cdot 9$

$(0.1:0.1:1) = v$

$9.8 \quad 10.2 \quad 10.6 \quad 11.0 \quad 11.4$

$(0.1:0.2:1) = b$

Objective: The objective of the experiment is to learn the basic concepts of MATLAB and learn how to use the MATLAB to solve different Mathematical problems. We can learn how to use MATLAB commands, syntax, toolboxes to solve Mathematical problem and how to get result of these problems. We can gain knowledge about many built in functions and their uses, and can gain knowledge about Matrices and vector's. And we also can learn how to solve different kind of problems about of matrices and vector's by Doing this Experiment, which helps us to be skilled in solving many Engineering problem in future.

Working Principle: MATLAB mainly works based on Matrix and Mathematical calculations. When we write a command or code in command window or in script Editor, MATLAB analysis the code and store all the variable in workspace, performs all calculation or solve the problem which is given in command and finally shows the results or output. The command window shows result immediately. Any small command even one line command also can give in command window. On the other hand, In script editor we can write multiple command together and can run them all at once.

### MATLAB CODE & and RESULT:

① Problem 1: Enter Matrices and Addressing the elements.

a)  $\gg A = [1 \ 2 \ 3 ; 4 \ 5 \ 6 ; 7 \ 8 \ 9]$

Result :

1 2 3  
4 5 6  
7 8 9

$\square = (A(1,1), A(1,2))$  @.

ANSWER : 1 2 3

ANSWER : 1 2 3

b)  $\gg D = [1 \ 2 \ 3 \ 4]$  result: 102003, 1.4

Name: Purnima Basak

ID: 23-51662-21795

c)  $\gg D' = \text{result of } 1 \text{ transpose diff to } 2 \text{ transpose}$

at 311014 and 313 of work must bro. GANTAM to address

d)  $\gg A(1,1) + A(2,2) + A(3,3)$ , result: 15. result of 3x3

e)  $\gg A(:, 2)$  result: 2  $\frac{2}{5}$  result of 2nd column elements GANTAM

f)  $\gg A(:, 3)$  result: 3  $\frac{6}{9}$  result of 3rd column elements GANTAM

g)  $\gg A(2, :)$  result: 4 5 6  $\frac{9}{2}$  result of 2nd row elements GANTAM

2nd row to bro. result of 2nd row must also same

Problem 2: Generating Matrices  $\rightarrow$  1st row bro. result of 1st row

a)  $\gg x = \text{linspace}(0, \pi, 10)$  result: 0 0.0314 0.0628 ..... 3.1416, result of 10

b)  $\gg x = (0: 0.001: 1) * \pi$  result: 0 0.0314 0.0628 ..... 3.1416, result of 10

c)  $\gg v = (10: -2: 0)$  result: 10 8 6 4 2 0, result of 6 rows

d)  $\gg A = \text{rand}(10, 10)$  result: 0.50670 0.90518 0.2051270 ..... 0.9134 0.0975 0.2785, result of 10 rows

e)  $\gg R = \text{rand}(10, 10)$  result: 0.5377 -1.3499 0.6715 0.88470 -0.6111480, result of 10 rows

Task 3: Problem 3: Deleting rows and columns  $\rightarrow$  1st row

a)  $\gg A(2, :) = []$  result: 1 2 3 4 5 6 7 8 9, result of 8 rows

b)  $R(:, 6:10) = []$  result: 0.5377 -1.3499 0.6715 0.8884 2 0.1022, result of 8 rows

c)  $\gg R(:, 1:5) = []$  result: 0.5377 -1.3499 0.6715 0.8884 2 0.1022, result of 6 rows

d)  $\gg R(:, 1:4) = []$  result: 0.5377 -1.3499 0.6715 0.8884 2 0.1022, result of 5 rows

e)  $\gg R(:, 1:3) = []$  result: 0.5377 -1.3499 0.6715 0.8884 2 0.1022, result of 4 rows

f)  $\gg R(:, 1:2) = []$  result: 0.5377 -1.3499 0.6715 0.8884 2 0.1022, result of 3 rows

g)  $\gg R(:, 1:1) = []$  result: 0.5377 -1.3499 0.6715 0.8884 2 0.1022, result of 2 rows

h)  $\gg R(:, 1:0) = []$  result: 0.5377 -1.3499 0.6715 0.8884 2 0.1022, result of 1 row

i)  $\gg R(:, 1:-1) = []$  result: 0.5377 -1.3499 0.6715 0.8884 2 0.1022, result of 8 rows

j)  $\gg R(:, 1:-2) = []$  result: 0.5377 -1.3499 0.6715 0.8884 2 0.1022, result of 7 rows

k)  $\gg R(:, 1:-3) = []$  result: 0.5377 -1.3499 0.6715 0.8884 2 0.1022, result of 6 rows

l)  $\gg R(:, 1:-4) = []$  result: 0.5377 -1.3499 0.6715 0.8884 2 0.1022, result of 5 rows

m)  $\gg R(:, 1:-5) = []$  result: 0.5377 -1.3499 0.6715 0.8884 2 0.1022, result of 4 rows

n)  $\gg R(:, 1:-6) = []$  result: 0.5377 -1.3499 0.6715 0.8884 2 0.1022, result of 3 rows

o)  $\gg R(:, 1:-7) = []$  result: 0.5377 -1.3499 0.6715 0.8884 2 0.1022, result of 2 rows

p)  $\gg R(:, 1:-8) = []$  result: 0.5377 -1.3499 0.6715 0.8884 2 0.1022, result of 1 row

### Discussion:

In this Experiment, we learned the basic working process and uses of MATLAB. The ~~uses~~ of we also learned about different problem and their solution of Matrixes, uses of command window - that allows direct ~~ed~~ calculations and shows the result of one line code immediately. we also saw how using MATLAB makes solving ~~problem~~ engineering problems of Matrices and vector. which is so efficient.

### Conclusion:

In conclusion, we can say that MATLAB is a powerful tool that simplify many different calculation. Make more easy to solve ~~the~~ many difficult problem of Matrices and vector. we can easily ~~solving~~ many problems which is more time consuming and difficult by using MATLAB. This Tool solve those problem more accurately and quickly which is really ~~help~~ helpful for us.