



AHSANULLAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

DEPARTMENT
OF
ELECTRICAL AND ELECTRONIC ENGINEERING

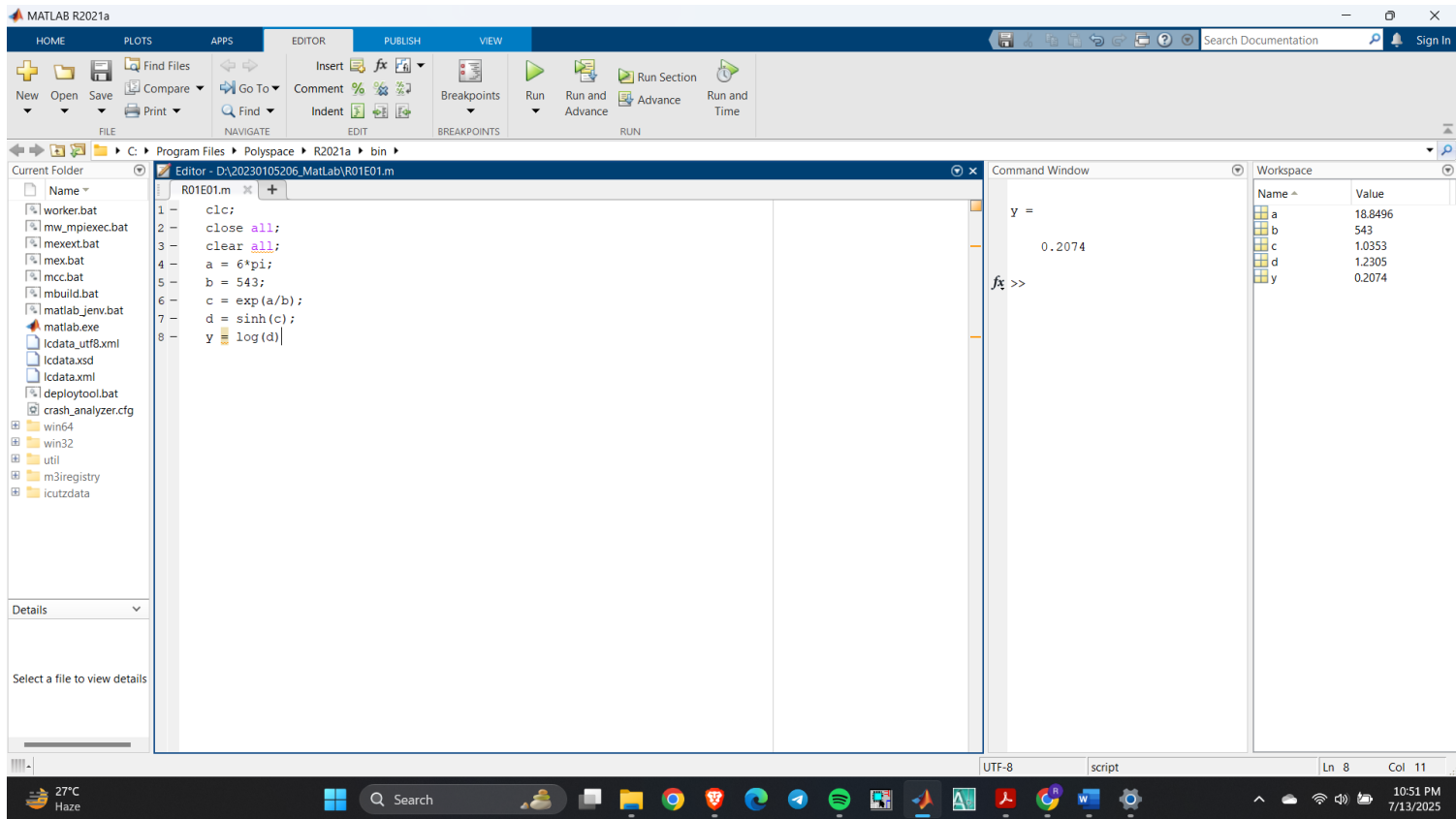
LAB REPORT

COURSE NO : EEE 2226
COURSE NAME : Numerical Technique Laboratory
EXPERIMENT NO : 01
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Year : 2nd
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Section : D(2)

Exercise 1. Find the value of $y = \ln(\sinh(e^{\frac{6\pi}{543}}))$



Exercise 2:

(a) Find the size, and length of following matrices

$A = [1 \ 2 \ 3; 4 \ 5 \ 6; 7 \ 6 \ 54; 65 \ 23 \ 45]$

$B = 7:1:13.5$

(b) Determine submatrix C and D from A.

$C = [2 \ 3; 6 \ 54; 23 \ 45]$

$D = [4 \ 5 \ 6]$

(c) Replace all the value of 2nd row into 10 and display the matrix A.

The screenshot shows the MATLAB R2021a environment. The Editor window displays the script `R01E02.m` with the following code:

```

1 clc;
2 close all;
3 clear;
4 %2 (a)
5 A = [1 2 3
6      4 5 6
7      7 6 54
8      65 23 45];
9 B=7:1:13.5;
10 size(A)
11 length(A)
12 size(B)
13 length(B)
14
15 %2 (b)
16 c=[2 3
17     6 54
18     23 45];
19 D=[4 5 6];
20 c=A([1,3,4],[2,3]);
21 D=A(2,:);
22 %2 (c)
23 A(2,:)=10
24
25

```

The Command Window shows the output of the script:

```

4      3

ans =

4

ans =

1      7

ans =

7

D =

4      5      6

A =

1      2      3
10     10     10
7       6     54
65     23     45

```

The Workspace window shows the following variables:

Name	Value
A	4x3 double
ans	7
B	[7.8 9.10 11.12 13]
c	[2.3 6.54 23.45]
D	[4.5 6]

#Exercise 3.

$A=[2 \ 3; \ 4 \ 5]; B=[3 \ 4; \ 6 \ 7];$

Find $A+B, A*B, A.^*B, A./B, A \setminus B, A.^2, A./B$

The screenshot shows the MATLAB R2021a environment. The Editor window displays the script `R01E03.m` with the following code:

```

1 clc;
2 close all;
3 clear;
4 A = [2 3; 4 5];
5 B = [3 4; 6 7];
6
7 A + B
8 A * B
9 A .* B
10 A ./ B
11 A \ B
12 A.^2
13 A ./ B
14
15

```

The Command Window shows the output of the script:

```

ans =

6      12
24      35

ans =

1.3333   -0.3333
0.6667    0.3333

ans =

24      29
42      51

ans =

4      6
8      10

ans =

0.6667    0.7500
0.6667    0.7143

```

The Workspace window shows the following variables:

Name	Value
A	[2,3;4,5]
ans	[0.6667,0.7500;0.6667,0.7143]
B	[3,4;6,7]

Exercise 4.

Define the matrices

$A = [17 \ 2 \ 3 \ 4; 5 \ 6 \ 7 \ 8; 9 \ 10 \ 11 \ 12; 13 \ 14 \ 15 \ 16]$

$B = [2 \ 3 \ 4 \ 5; 6 \ 7 \ 8 \ 9; 10 \ 11 \ 12 \ 13; 14 \ 15 \ 16 \ 17]$

$C = [1 \ 2 \ 3; 4 \ 5 \ 6; 7 \ 8 \ 9]$

$y = [4 \ 3 \ 2 \ 1]'$

Note the transpose ' on the y-vector which makes y a column vector.

- Compute AB and BA. Is matrix multiplication commutative?
- Compute AC. Why do you get an error message?

3

The image shows the MATLAB R2021a interface. The Editor window displays a script with the following code:

```
1 clear;
2 close all;
3 clear;
4 A=[17 2 3 4; 5 6 7 8; 9 10 11 12; 13 14 15 16];
5 B=[ 2 3 4 5 ; 6 7 8 9 ; 10 11 12 13 ; 14 15 16 17 ];
6 C=[ 1 2 3 ; 4 5 6 ; 7 8 9 ];
7 y=[ 4 3 2 1 ]';
8
9 AB = A * B
10 BA = B * A
11 isequal(AB, BA);
12 % as AB ≠ BA Matrix multiplication is NOT commutative
13
14 AC=A*c
15 % The operation A * C will fail due to dimension mismatch (as noted in the original output)
```

The Command Window shows the results of the calculations:

AB =

132	158	184	210
228	254	280	306
356	398	440	482
484	542	600	658

BA =

150	132	146	160
326	260	290	320
502	388	434	480
678	516	578	640

Unrecognized function or variable 'c'.

Error in R01E04 (line 14)
AC=A*c

f>>

The Workspace window shows the following variables:

Name	Value
A	4x4 double
AB	4x4 double
ans	0
B	4x4 double
BA	4x4 double
C	[1,2,3,4,5,6,7,8,9]
y	[4,3,2,1]

Exercise 5.

(a) Solve the following system of equations:

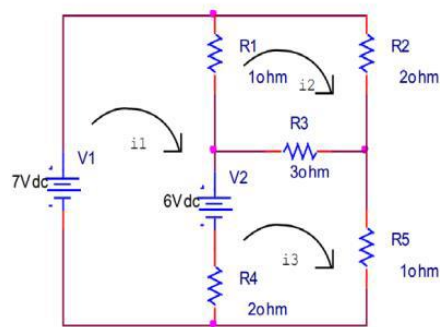
$$17x_1 + 2x_2 + 3x_3 + 4x_4 = 4$$

$$5x_1 + 6x_2 + 7x_3 + 8x_4 = 3$$

$$9x_1 + 10x_2 + 11x_3 + 12x_4 = 2$$

$$13x_1 + 14x_2 + 15x_3 + 16x_4 = 1$$

(b) Solve the following circuit to find i_1 , i_2 , and i_3 .



Ans: $i_1 = 3$ amp, $i_2 = 2$ amp, $i_3 = 3$ amp.

For (b) using mesh analysis,

$$\text{Loop}_1: 3i_1 - i_2 - 2i_3 = 1$$

$$\text{Loop}_2: i_1 - 6i_2 + 3i_3 = 0$$

$$\text{Loop}_3: 2i_1 + 3i_2 - 6i_3 = -6$$

MATLAB R2021a

HOME PLOTS APPS EDITOR PUBLISH VIEW

File Edit Breakpoints Run Run and Advance Run Section Run and Time

Current Folder: C:\Program Files\Polyspace\R2021a\bin

Editor: D:\20230105206_MatLab\R01E05.m

```

1  clc;
2  close all;
3  clear;
4  % Part (a)
5  A = [17 2 3 4; 5 6 7 8; 9 10 11 12; 13 14 15 16];
6  y = [4; 3; 2; 1];
7
8  x = A \ y;
9
10 x =
    3.0000
    2.0000
    3.0000
    3.0000
11 % Part (b)
12 m = [3 -1 -2; 1 -6 3; 2 3 -6];
13 n = [1; 0; -6];
14 k = m \ n
  
```

Command Window

Warning: Matrix is close to singular or badly scaled. Results may be inaccurate. RCOND = 1.309225e-18.
> In R01E05 (line 10)

k =

```

    3.0000
    2.0000
    3.0000
  
```

Workspace

Name	Value
A	4x4 double
k	[3.0000; 2.0000; 3.0000]
m	[3, -1, -2; 1, -6, 3; 2, 3, -6]
n	[1; 0; -6]
x	[1.4629e-15; 9.30...]
y	[4; 3; 2; 1]

28°C Haze 11:49 PM 7/13/2025