



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 : 04
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Section : D(2)

#Exercise 1:

Construct a polynomial such that $C(x) = A(x) * B(x)$

Where $A(x) = 3x^2 + 2x - 4$ and $B(x) = 2x^3 - 2$

Also find the roots of $A(x)$, $B(x)$ and $C(x)$.

The image shows the MATLAB R2021a interface. The Editor window displays a script named R04E01.m with the following code:

```
1 clc;
2 close all;
3 clear;
4
5 A = [3 2 -4];
6 B = [2 0 0 -2];
7 C = conv(A, B);
8
9 disp('Coefficient of A(x):')
10 disp(A)
11 disp('Coefficient of B(x):')
12 disp(B)
13 disp('Coefficient of C(x):')
14 disp(C)
15
16 rA = roots(A);
17 rB = roots(B);
18 rC = roots(C);
19
20 disp('Roots of A(x):')
21 disp(rA)
22 disp('Roots of B(x):')
23 disp(rB)
24 disp('Roots of C(x):')
25 disp(rC)
26
27 fprintf('nC(x) = ')
28 fprintf('%g*x^%d ', [C; length(C)-1:-1:0])
29 fprintf('\n')
30
```

The Command Window displays the results of the script:

```
Coefficient of A(x) :
     3     2    -4

Coefficient of B(x) :
     2     0     0    -2

Coefficient of C(x) :
     6     4    -8    -6    -4     8

Roots of A(x) :
-1.5352
 0.8685

Roots of B(x) :
-0.5000 + 0.8660i
-0.5000 - 0.8660i
 1.0000 + 0.0000i

Roots of C(x) :
-1.5352 + 0.0000i
-0.5000 + 0.8660i
-0.5000 - 0.8660i
 1.0000 + 0.0000i
 0.8685 + 0.0000i

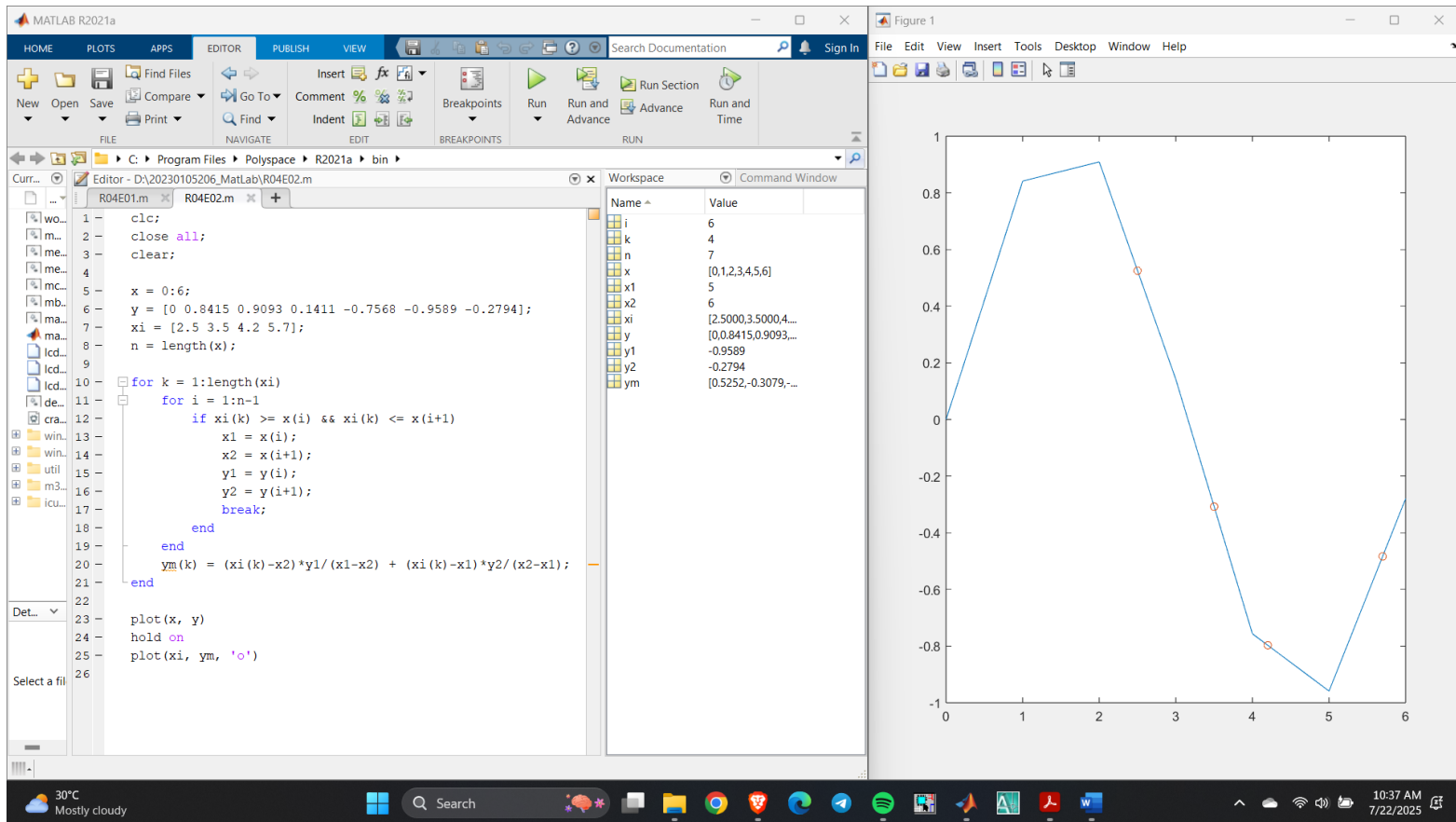
C(x) = +6*x^5 +4*x^4 -8*x^3 -6*x^2 -4*x^1 +8*x^0
fx >>
```

#Exercise 2.

Plot the curve corresponding to table1 using linear interpolation.

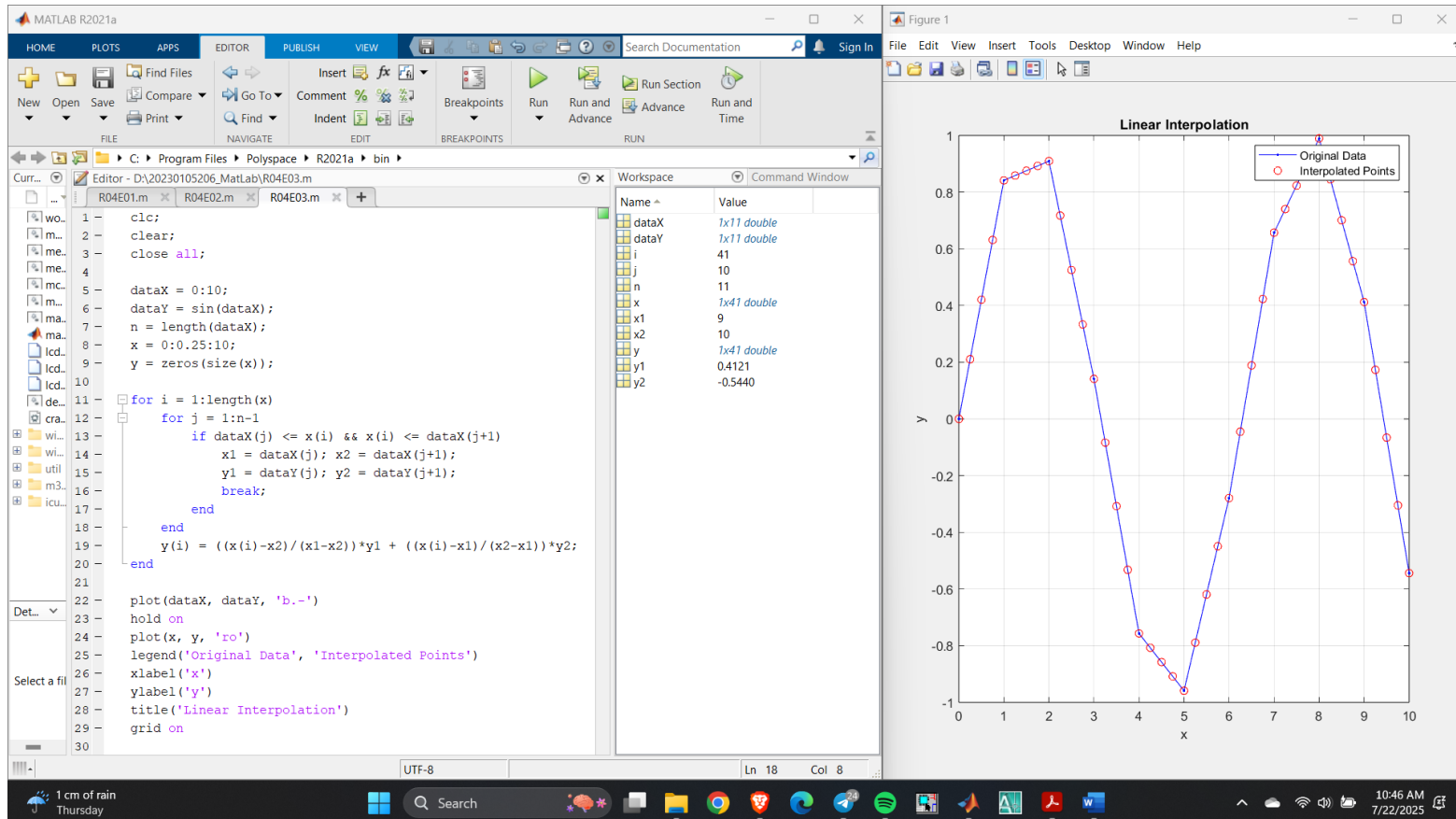
Table 1

x	$f(x)$
0	0
1	0.8415
2	0.9093
3	0.1411
4	-0.7568
5	-0.9589
6	-0.2794



#Exercise 3.

$y = \sin(x); x = 0:10; x(i) = 0:0.25:10$; Construct the interpolant y and plot.



#Exercise 4.

Write a MATLAB program implementing Lagrange Polynomial.

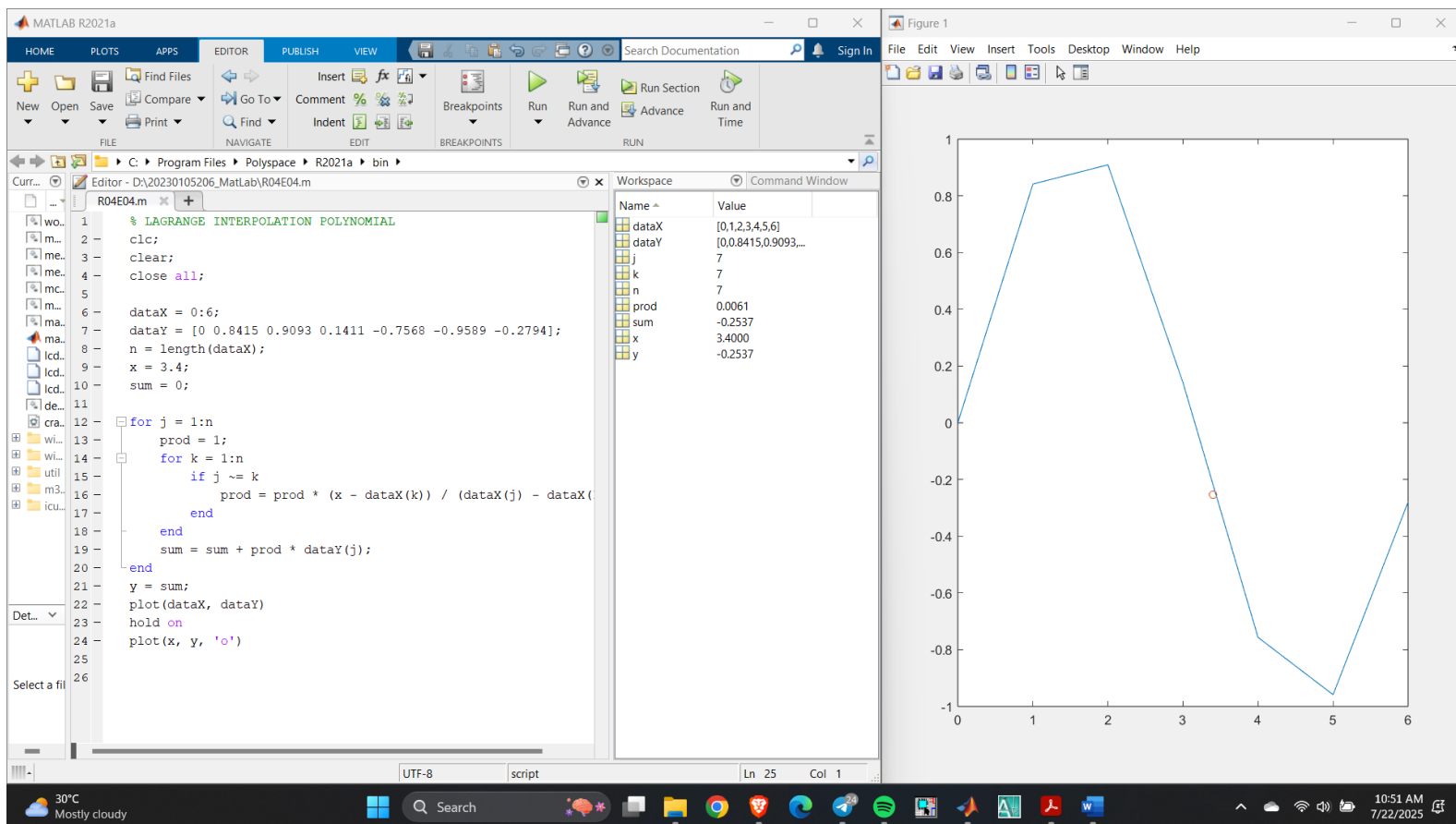
#Exercise 5.

Construct a Lagrange interpolating polynomials for the data points given in table 1.

Table 1

x	$f(x)$
0	0
1	0.8415
2	0.9093
3	0.1411
4	-0.7568
5	-0.9589
6	-0.2794

Taking random value $X=3.4$;



some random values of x (here $x = [2.5 \ 3 \ 3.5 \ 4 \ 4.5]$ is taken)

