AMERICAN INTERNATIONAL UNIVERSITY–BANGLADESH (AIUB)

FACULTY OF ENGINEERING

DEPARTMENT OF COMPUTER ENGINEERING

DATA COMMUNICATION

Spring 2023-2024

Section: F

Group: 03

LAB REPORT ON

Introduction to MATLAB.

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Date of Experiment: **January 24, 2024**

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Title: Introduction to MATLAB.

Performance Task:

ID = AB-CDEFG-H = 22-46588-1

According to the above statement-

A = 2

B = 2

C = 4

D = 6

E = 5

F = 8

G = 8

H = 1

$x_1(t) = A_1 \cos((2\pi(C+D+E+F)\ t) + j_1)$

$x_2(t) = A_2 \cos((2\pi(C+D+E+F)\ t) + j_2)$

(a) $A_1 = A + B = 2 + 2 = 4$

$A_2 = G + H = 8 + 1 = 9$

$J_1 = D + G = 6 + 8 = 14^o$

$J_2 = 30^o$

$x_1 = 4*\cos((2*pi(4+6+5+8)\ t) + 14)$

$x_2(t) = 9*\cos((2*pi*(4+6+5+8)\ t) + 30)$

(b)

```
A = 2;
B = 2;
C = 4;
D = 6;
E = 5;
F = 8;
G = 8;
H = 1;

rad = pi/180;

A1 = A + B;
j1 = (D + G)*rad;
t = -0.1 : 0.001 : 0.1;
x1 = A1 * cos((2* pi * (C + D + E + F) * t )+ j1);

plot(t,x1)
xlabel('time (t)');
ylabel('signal (x1)');
title('Signal (x1 / t)');
```

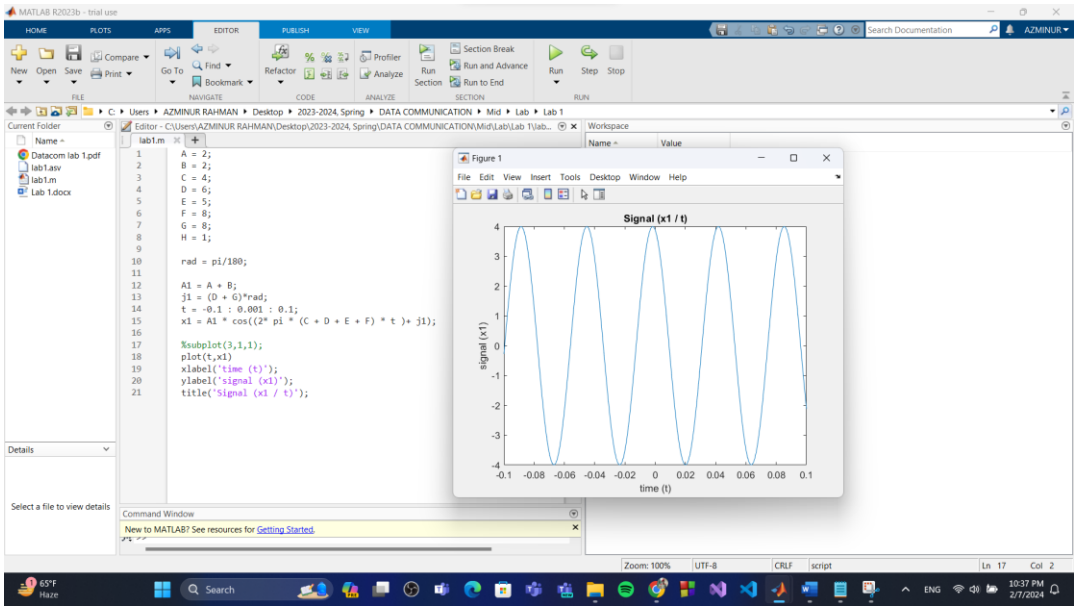

Fig 01: x1

```
A = 2;
B = 2;
C = 4;
D = 6;
E = 5;
F = 8;
G = 8;
H = 1;

rad = pi/180;

A2 = G + H;
j2 = 30*rad;
x2 = A2 * cos((2* pi * (C + D + E + F) * t )+ j2);

plot(t,x2)
xlabel('time (t)');
ylabel('signal (x2)');
title('Signal (x2 / t)');
```

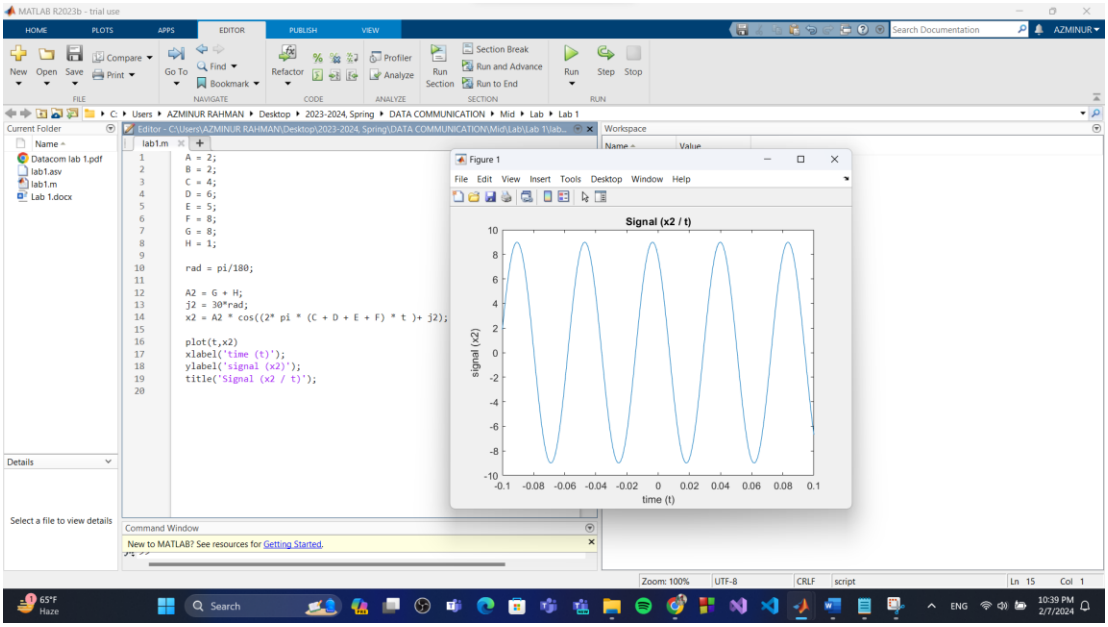

Fig 02: x2

(c)

```
A = 2;
B = 2;
C = 4;
D = 6;
E = 5;
F = 8;
G = 8;
H = 1;

rad = pi/180;

A1 = A + B;
j1 = (D + G)*rad;
t = -0.1 : 0.001 : 0.1;
x1 = A1 * cos((2* pi * (C + D + E + F) * t )+ j1);

A2 = G + H;
j2 = 30*rad;
x2 = A2 * cos((2* pi * (C + D + E + F) * t )+ j2);

plot(t, x1)
plot(t, x2)
plot(t,angle(x1)),title('Phase Plot')
plot(t,abs(x1)),title('Amplitude Plot')
plot (t, angle(x2)), title('Phase Plot')
plot (t, abs(x2)), title('Amplitude Plot')
```

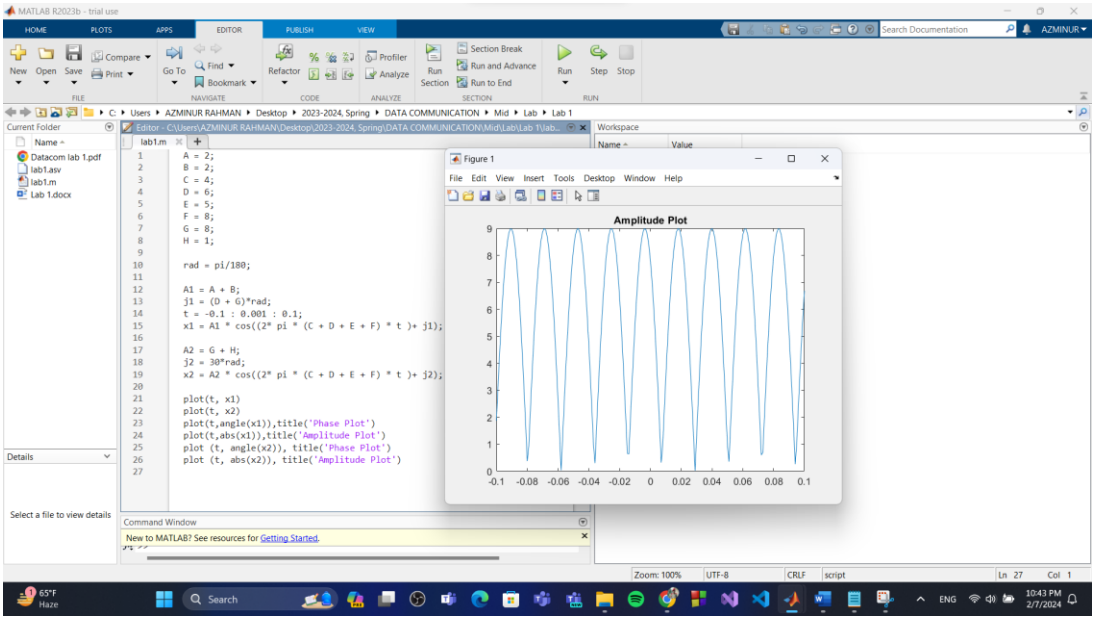

Fig 03: x1 & X2

(d)

```
A = 2;
B = 2;
C = 4;
D = 6;
E = 5;
F = 8;
G = 8;
H = 1;

rad = pi/180;

A1 = A + B;
j1 = (D + G)*rad;
```

```
t = -0.1 : 0.001 : 0.1;
x1 = A1 * cos((2* pi * (C + D + E + F) * t )+ j1);

subplot(3,1,1);
plot(t,x1)
xlabel('time (t)');
ylabel('signal (x1)');
title('Signal (x1 / t)');

A2 = G + H;
j2 = 30*rad;
x2 = A2 * cos((2* pi * (C + D + E + F) * t )+ j2);

subplot(3,1,2);
plot(t,x2)
xlabel('time (t)');
ylabel('signal (x2)');
title('Signal (x2 / t)');
```

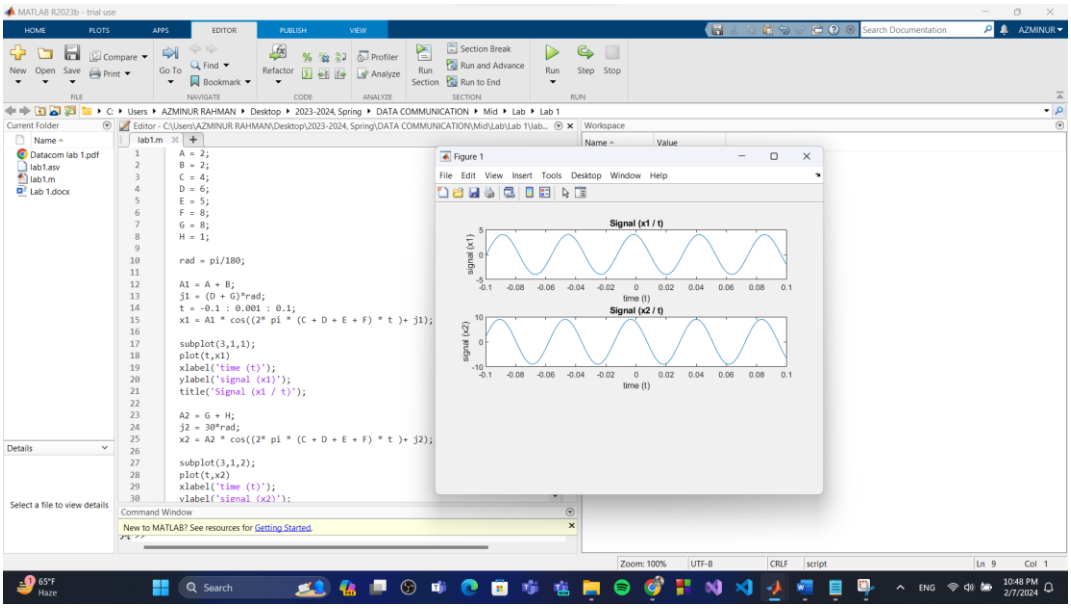

Fig 04: Subplot of X1 & X2

(e)

```
A = 2;
B = 2;
C = 4;
D = 6;
E = 5;
F = 8;
G = 8;
H = 1;

rad = pi/180;

A1 = A + B;
j1 = (D + G)*rad;
t = -0.1 : 0.001 : 0.1;
x1 = A1 * cos((2* pi * (C + D + E + F) * t )+ j1);

subplot(3,1,1);
plot(t,x1)
xlabel('time (t)');
ylabel('signal (x1)');
title('Signal (x1 / t)');

A2 = G + H;
```

```
j2 = 30*rad;
x2 = A2 * cos((2* pi * (C + D + E + F) * t )+ j2);

subplot(3,1,2);
plot(t,x2)
xlabel('time (t)');
ylabel('signal (x2)');
title('Signal (x2 / t)');

x3 = x1 + x2 ;

subplot(3,1,3);
plot(t,x3)
xlabel('time (t)');
ylabel('signal (x3)');
title('Signal (x3 / t)');
```

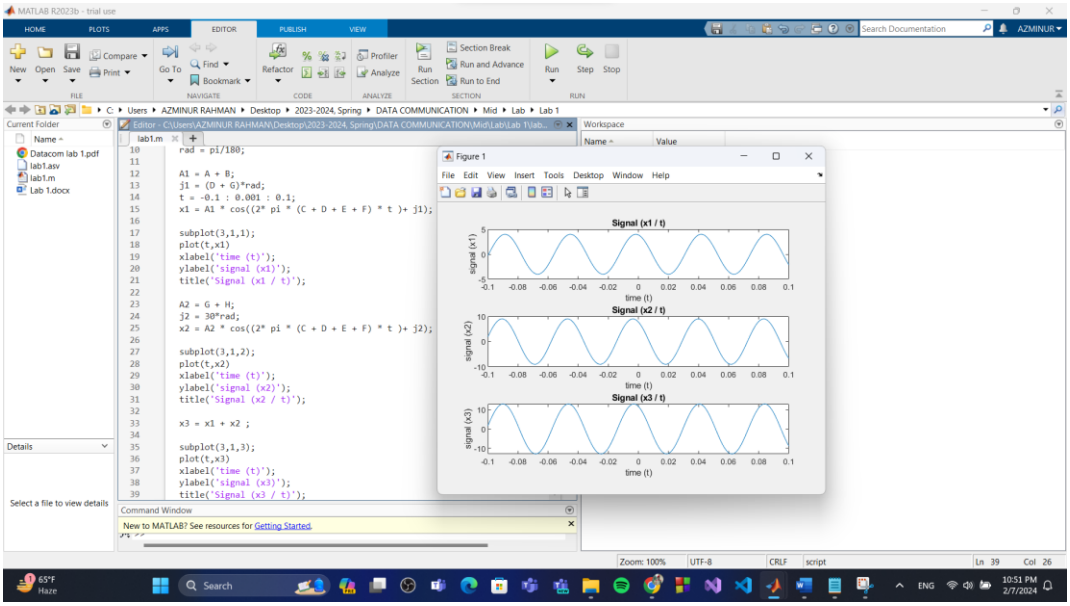

Fig 05: Subplot of X1, X2 & X3

(f)

```
A = 2;
B = 2;
C = 4;
D = 6;
E = 5;
F = 8;
G = 8;
H = 1;

rad = pi/180;

A1 = A + B;
j1 = (D + G)*rad;
t = -0.1 : 0.001 : 0.1;
x1 = A1 * cos((2* pi * (C + D + E + F) * t )+ j1);

A2 = G + H;
j2 = 30*rad;
x2 = A2 * cos((2* pi * (C + D + E + F) * t )+ j2);

x3 = x1 + x2 ;


plot(t, x1)
plot(t, x2)
plot(t,angle(x1)),title('Phase Plot')
```

```
plot(t,abs(x1)),title('Amplitude Plot')
plot (t, angle(x2)), title('Phase Plot')
plot (t, abs(x2)), title('Amplitude Plot')
subplot (3,1,1), plot (t,x1)
subplot (3,1,2), plot (t,x2)
subplot (3,1,3), plot (t, x3)
subplot (3,1,3), plot (t, x3)
plot (t, abs(x3)), title('Amplitude Plot')
plot (t, angle(x3)), title('Phase Plot')
```

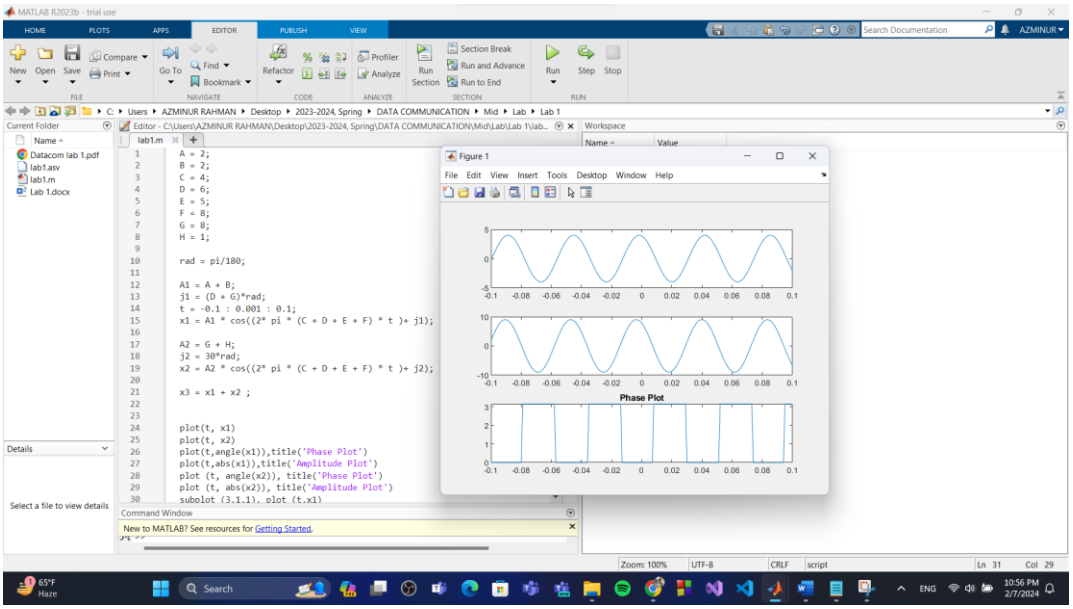

Fig 06: Phase of X3