LAB REPORT NO 7
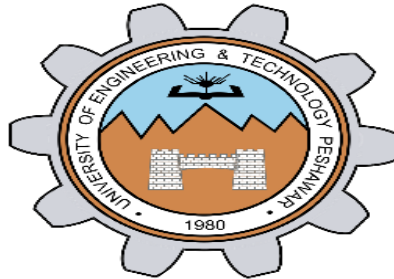
Submitted by: **Muhammad Ali**

Registration No: - **19PWCSE1801**

Class Section: A

"On my honor, as student of University of Engineering and Technology, I have neither given nor received unauthorized assistance on this academic work."

Submitted to:

Engr. Durr-e-Nayab

Data:(04,07,2021)

Department of Computer Systems Engineering

University of Engineering and Technology, Peshawar

Objectives: -

- T o learn signal scaling and shifting in matlab.
- To understand how add or subtract, a original signal and shift or scale signal.
- To see invertibility/flipping of signal in matlab.
- To derived up-sample and down-sample of a signal.

Task no 1: -

```
clc
clear all
close all

sign=ones(1,21);
sign(1,1:10)=-1;
sign(1,12:21)=1;
sign(1,11)=0;
stem(sign);
title('-10=<n=<10');
axis([-10 30 -1 1]);
```
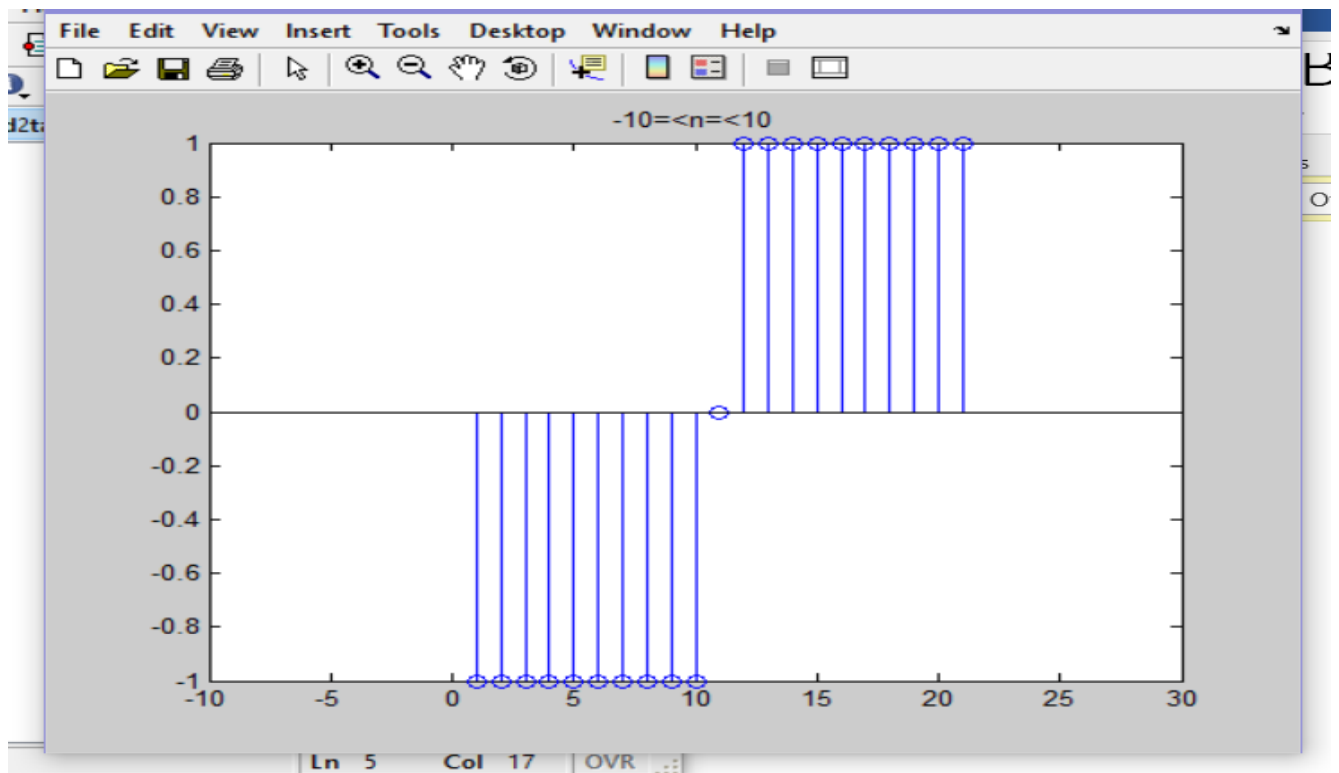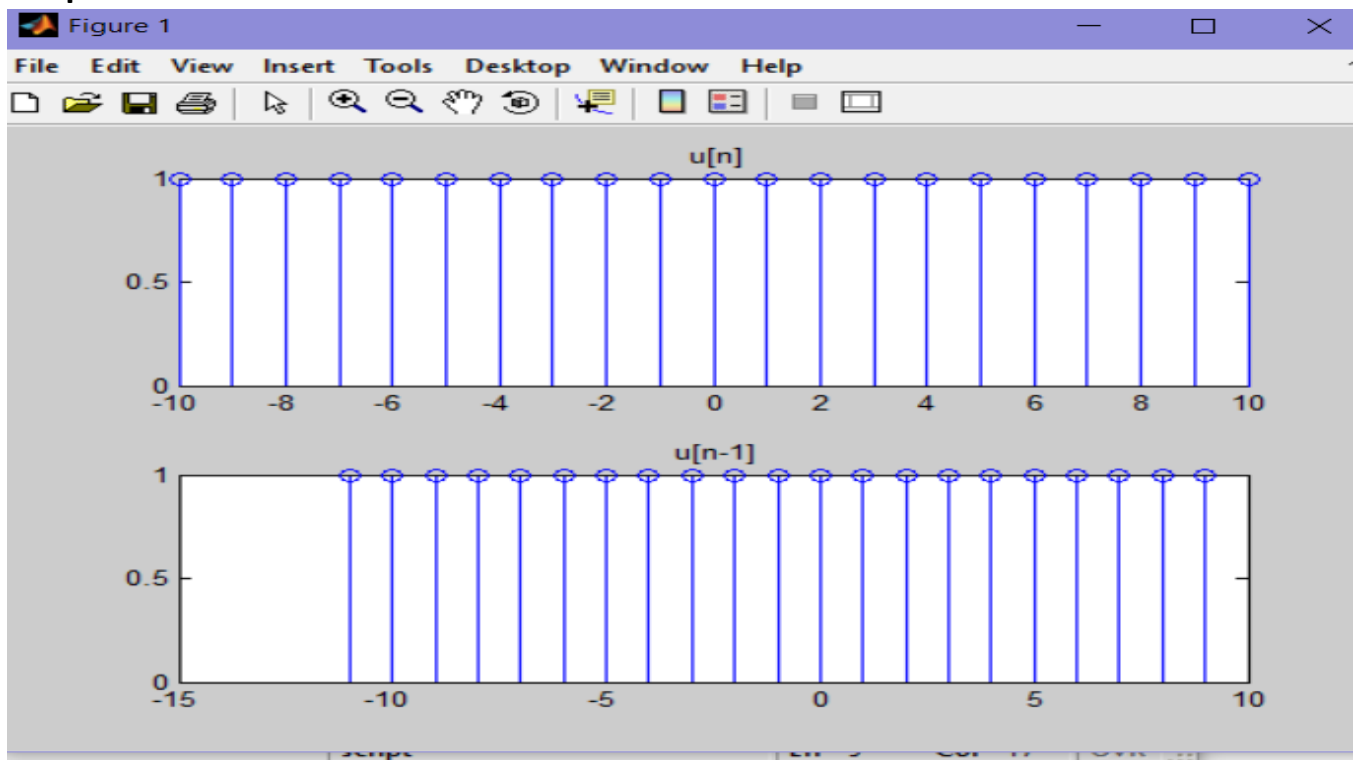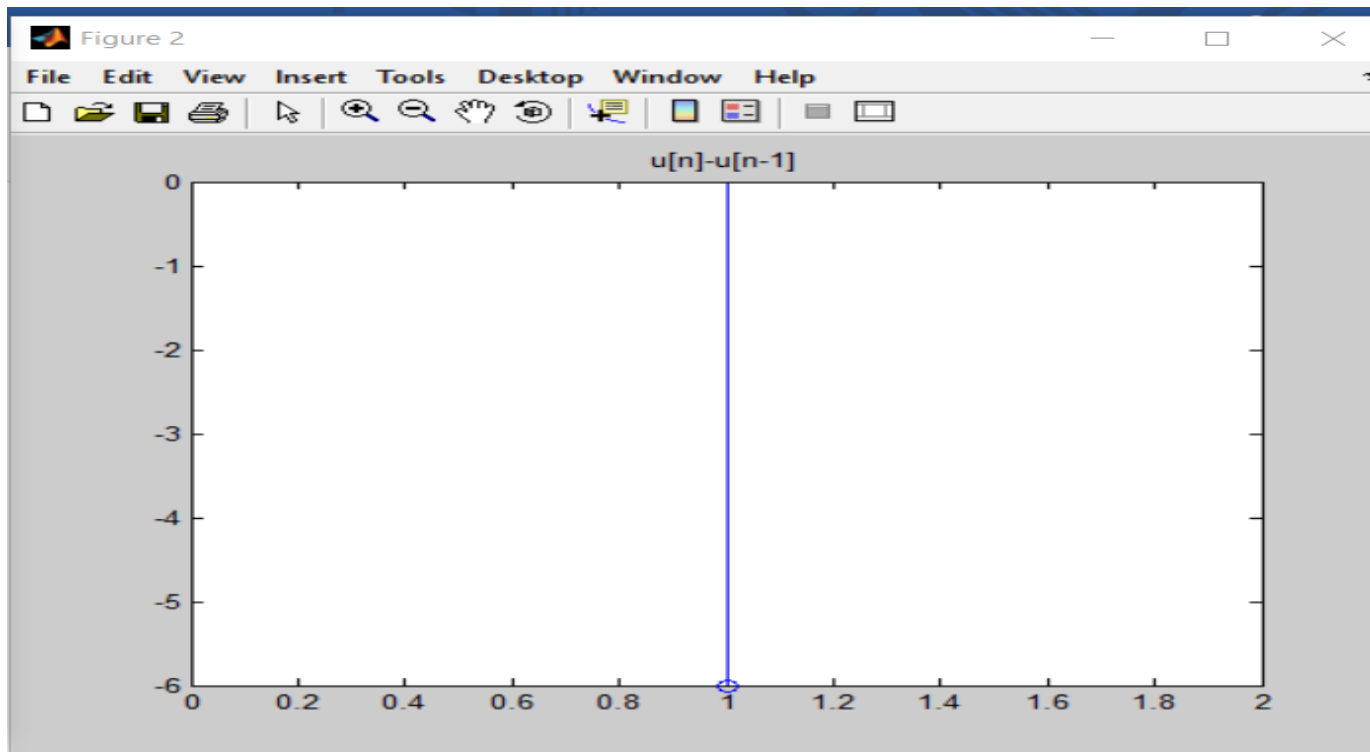
Output :-

no 2: -

Task no 2: -

```
clc
clear all
close all
t=-10:10;
sign=ones(1,21);
sign(1,1:21)=1;
subplot(2,1,1);
usign=stem(t,sign);
title(' u[n]');
subplot(2,1,2);
shiftusign=stem(t-1,sign);
title(' u[n-1]');
figure;
sigma=usign-shiftusign;
stem(sigma);
title(' u[n]-u[n-1] ');
```
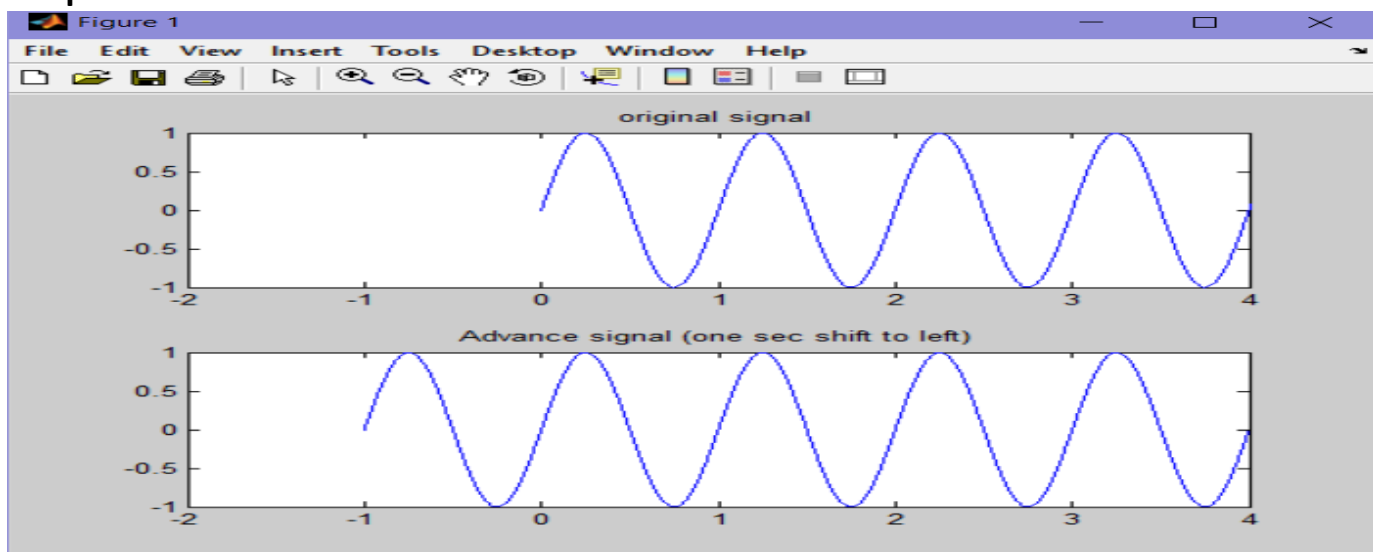
Output :-

Task no 3: -

```
clc
clear all
close all
t=0:0.003:5;
subplot(2,1,1);
sign=sin(t*2*pi);
plot(t,sign);
title(' original signal ');
axis([-2 4 -1 1]);
subplot(2,1,2);
plot(t-1,sign);
title(' Advance signal (one sec shift to left) ');
axis([-2 4 -1 1]);
```
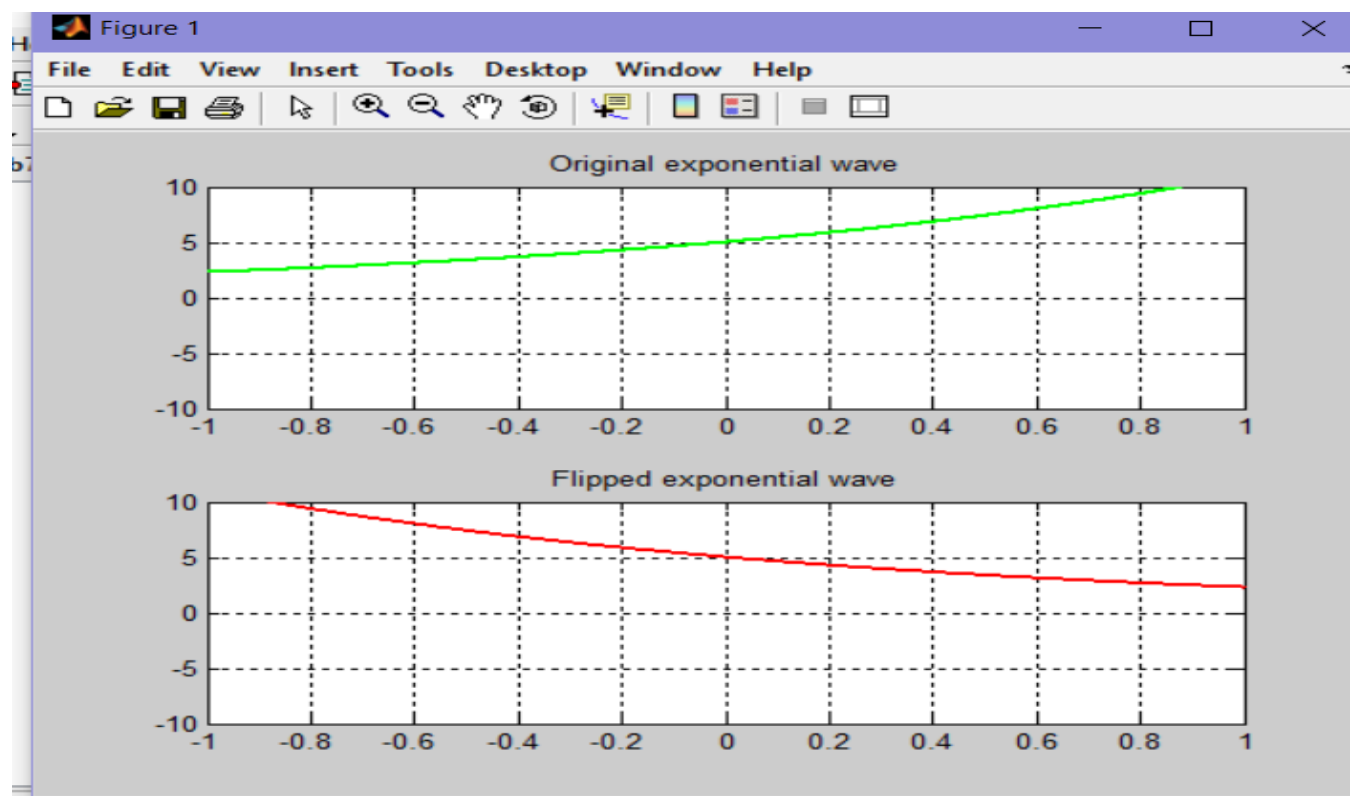
Output :-

Task no 4: -

```
clc
close all
clear all
n=-1:1/1000:1;
signal=5*exp(1*n*pi/4);
subplot(2,1,1);
plot(n,signal, 'g', 'linewidth',2);
axis([-1 1 -10 10]);
title('Original exponential wave');
grid;
subplot(2,1,2);
plot(-n,signal, 'r', 'linewidth',2);
axis([-1 1 -10 10]);
title('Flipped exponential wave');
grid;
```
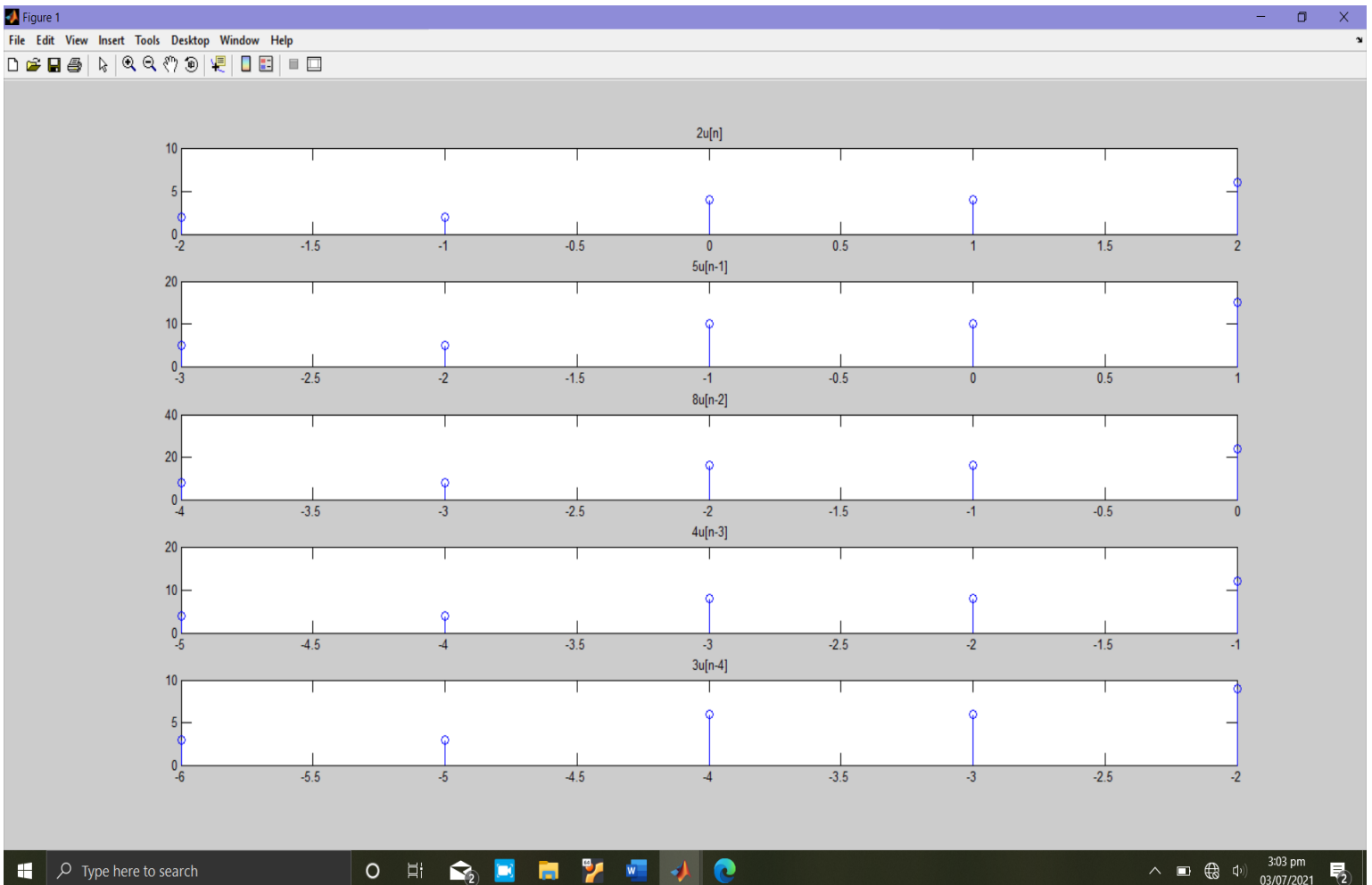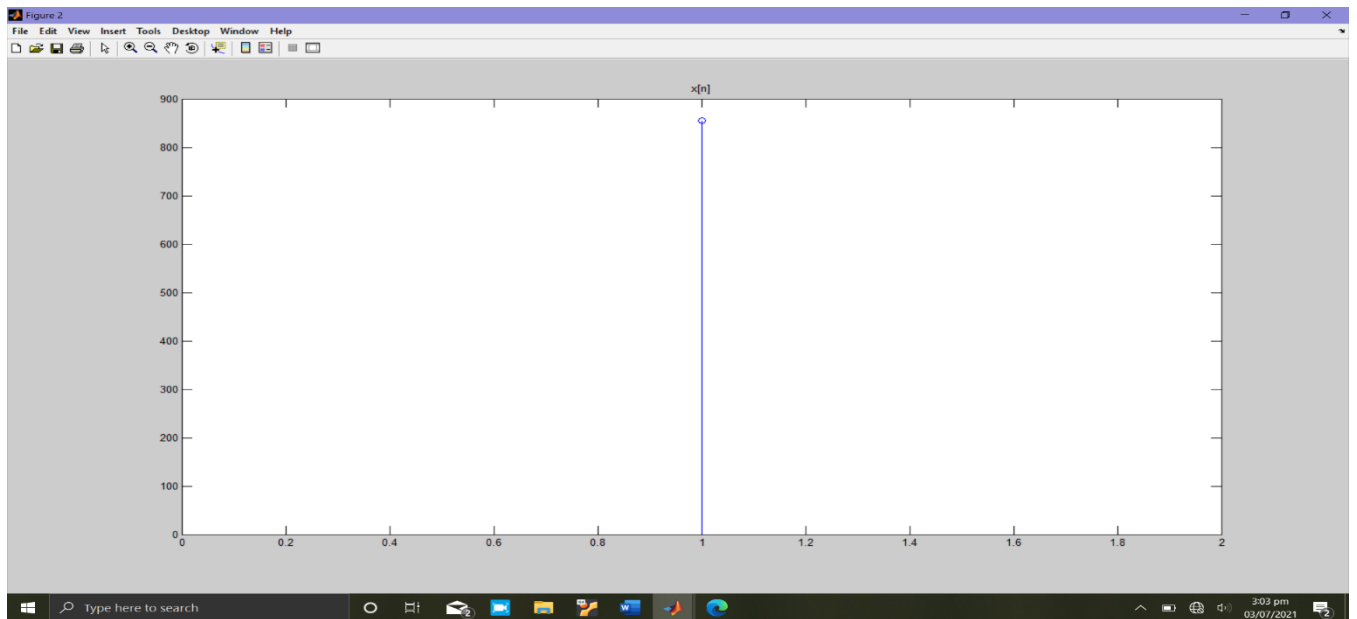
Output :-

Task no 5: -

```
clc
clear all
close all
t=-2:2;
sigma=[1,1,2,2,3];    %let sigma be a siganl
subplot(5,1,1);
usign=stem(t,2*sigma);
title(' 2u[n]');
subplot(5,1,2);
u2sign=stem(t-1,5*sigma);
title(' 5u[n-1]');
subplot(5,1,3);
u3sign=stem(t-2,8*sigma);
title(' 8u[n-2]');
subplot(5,1,4);
u4sign=stem(t-3,4*sigma);
title(' 4u[n-3]');
subplot(5,1,5);
u5sign=stem(t-4,3*sigma);
title(' 3u[n-4]');
figure;
x=usign+u2sign+u3sign+u4sign+u5sign;
stem(x);
title(' x[n] ');
```
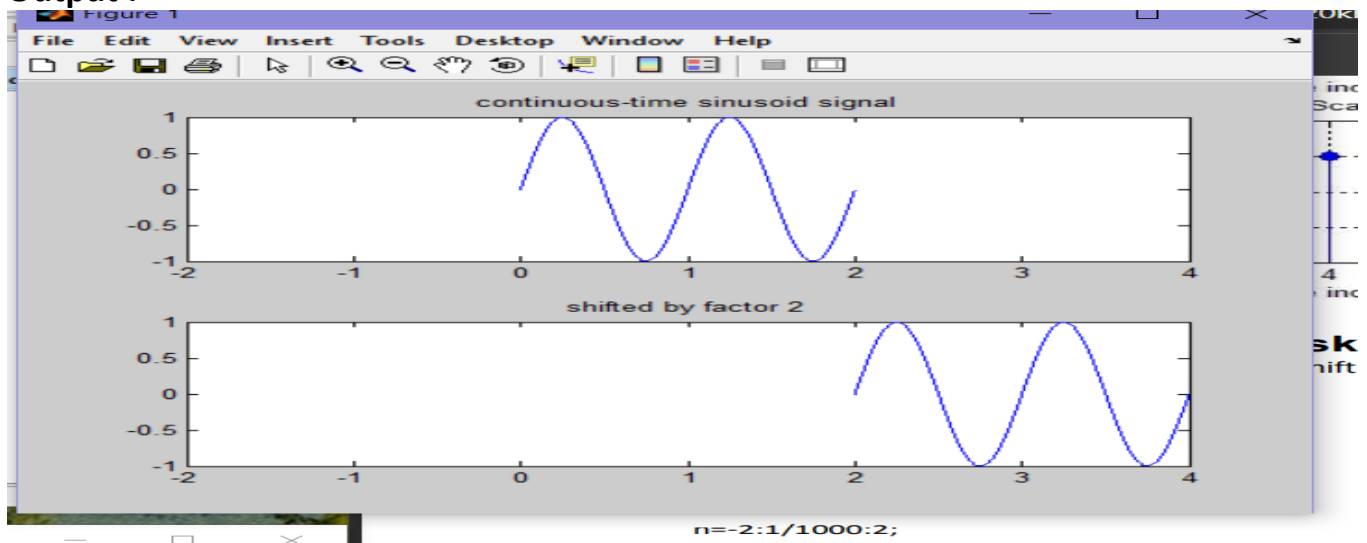
Output :-

Task no 6: -

```
clc
clear all
close all
t=0:0.0002:2;
subplot(2,1,1);
sign=sin(t*2*pi);
plot(t,sign);
title(' continuous-time sinusoid signal ');
axis([-2 4 -1 1]);
subplot(2,1,2);
plot(t+2,sign);
title(' shifted by factor 2 ');
axis([-2 4 -1 1]);
```

Output :-

Task no 7: -

```
clc
clear all
n=-2:1/1000:2;
x1=sin(2*pi*2*n);
x2=interp(x1,2);
subplot(2,1,1);
plot(x1); title('Original signal');
xlabel('Sample Number');
ylabel('Signal Amplitude');
axis([0 4000 -1 1]);
subplot(2,1,2);
plot(x2);
title('interp signal'); xlabel('Sample Number');
ylabel('Signal Amplitude');
axis([0 4000 -1 1]);
```

Output :-