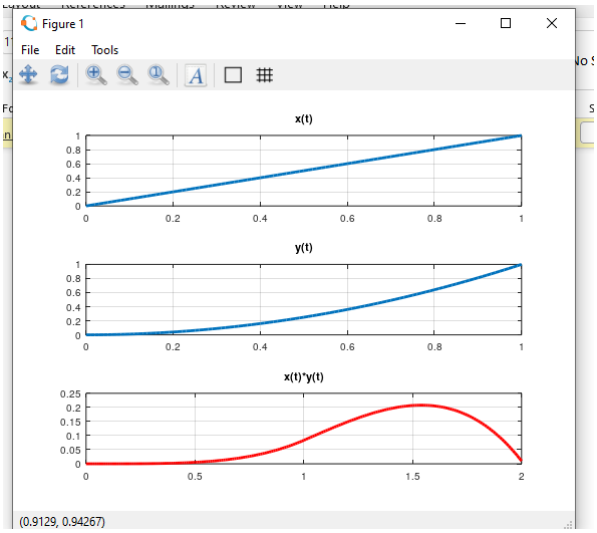
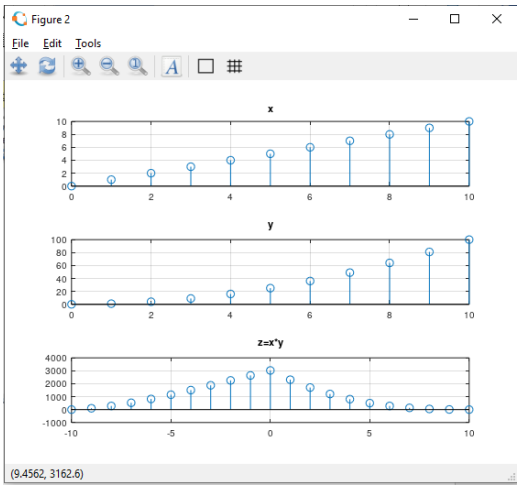
TEMA 3

1.

```
 clc;
clear all;
close all;
pkg load signal;

figure(1);
t= 0: 0.01: 1;
x=t;
subplot (3,1,1);
plot(t,x,'linewidth',2);
title('x(t)');
grid;
h=(t).^2;
subplot(3,1,2);
plot(t,h,'linewidth',2);

title('y(t)');
grid;

t2= 0: 0.01: 2;
y=conv(x,h)*0.01;

subplot(3,1,3);
plot(t2,y,'r','linewidth',2);
title('x(t)*y(t)')
```



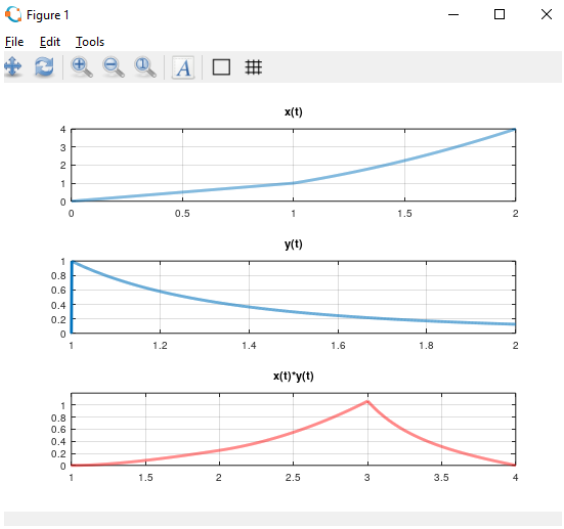


```
axis(); grid;


figure(2);
n=0:10;
x=n;
y=n.*n;
[z, intarziere]=xcorr(x,y);

subplot(3,1,1);
stem(n,x);
axis(); grid;
title(['x']);

subplot(3,1,2);
stem(n,y);
axis(); grid;
title(['y']);

subplot(3,1,3);
stem(intarziere,z);
axis(); grid;
title(['z=x*y']);
```

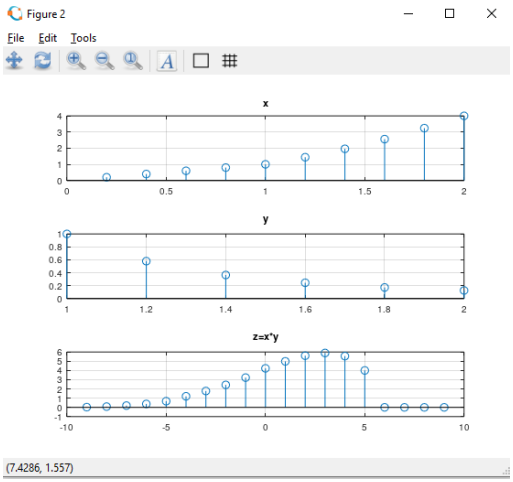
2.

```
clc;
clear all;
close all;
pkg load signal;
```

```
figure(1);
t=0.001: 0.001: 2;
x=t.*(t<=1) + t.*t.*(1<t);
y=(t.^(-3)).*(t>1);

subplot (3,1,1);
plot(t,x, 'linewidth',2);
title('x(t)');
grid;
```



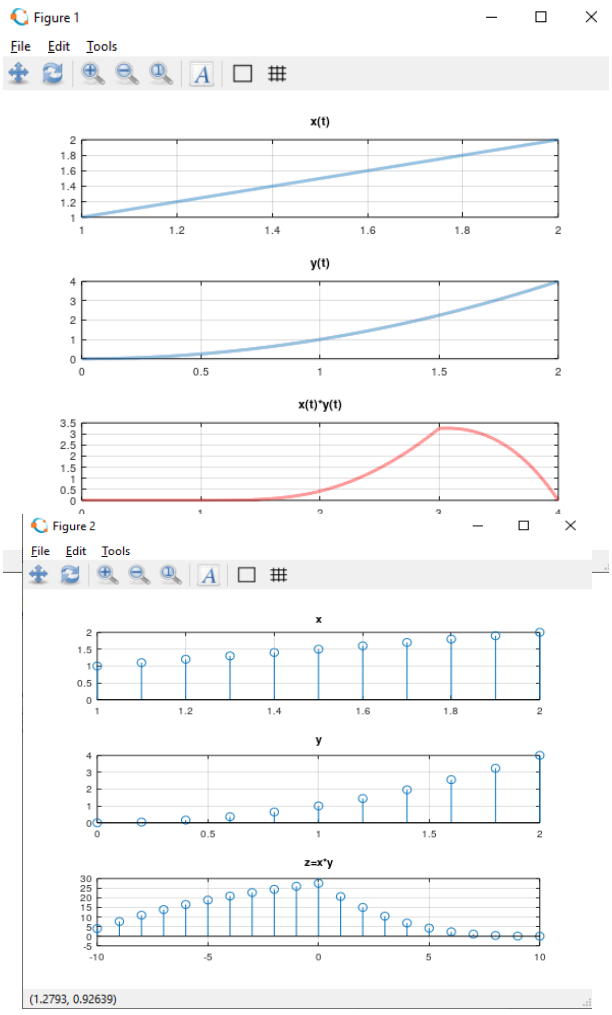

```
subplot(3,1,2);
plot(t,y,'linewidth',2);
title('y(t)');
axis([1 2 0 1]);grid;

t2= 0.002: 0.001: 4;
h=conv(x, y)*0.001;

subplot(3,1,3);
plot(t2,h,'r','linewidth',2);
title('x(t)*y(t)');
axis([1 4 0 1.2]);grid;

figure(2);
n=0.2: 0.2: 2;
x=n.*(n<=1)+(n.*n).*(n>1);
y=(((n).^(-3)).*(n>=1));
[z, intarziere]=xcorr(x,y);
```



```
subplot(3,1,1);
stem(n,x);
axis();grid; title(['x']);

subplot(3,1,2);
stem(n,y);
axis([1 2 0 1]);grid; title(['y']);

subplot(3,1,3);
stem(intarziere,z);
axis(); grid;
title(['z=x*y']);
```

3.

```
clc;
clear all;
close all;
pkg load signal;

figure(1);
t= 0: 0.0001: 2;
x=t.*(t>=1);
y=t.^2;

subplot (3,1,1);
plot(t,x,'linewidth',2);
title('x(t)');
axis([1 2 1 2]);
grid;
```

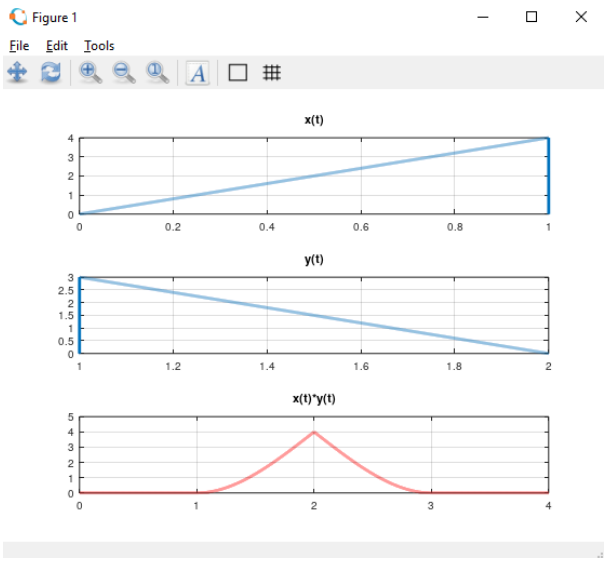


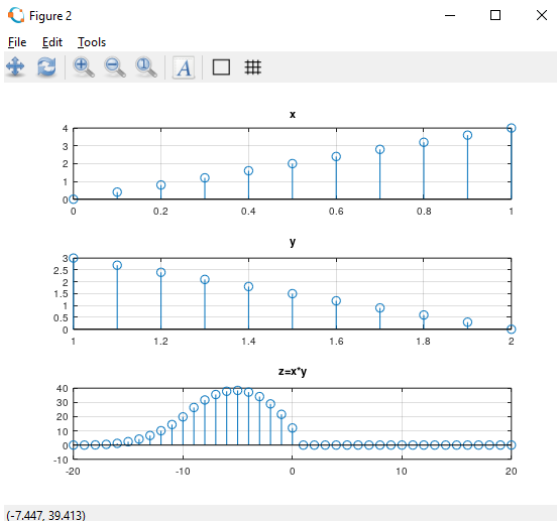
```
subplot(3,1,2);
plot(t,y,'linewidth',2);
title('y(t)');
grid;

t2= 0: 0.0001: 4;
h=conv(x, y)*0.0001;

subplot(3,1,3);
plot(t2,h,'r','linewidth',2);
title('x(t)*y(t)')
axis(); grid;

figure(2);
n=1: 0.1: 2;
x=n.*(1<=n).*(n<=2);
n_h=0: 0.2: 2;
y=n_h.*n_h;
[z, intarziere]=xcorr(x,y);

subplot(3,1,1);
stem(n,x);
axis(); grid;
title(['x']);

subplot(3,1,2);
stem(n_h,y);
axis(); grid;
```

```
title(['y']);


subplot(3,1,3);
stem(intarziere,z);
axis(); grid;
title(['z=x*y']);
```

5.

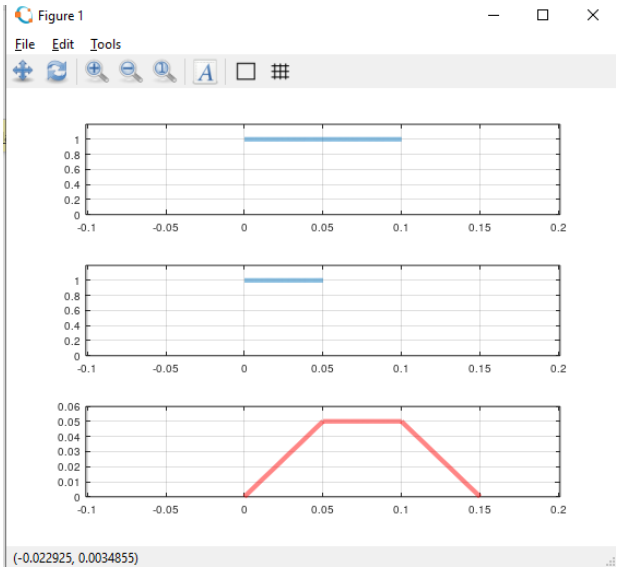
```
clc;
clear all;
close all;

pkg load signal;

figure(1);
t=0: 0.0001: 2;
x=4.*t.*(t<=1);
y=(-3.*t+6).*(t>=1);

subplot (3,1,1);
plot(t,x, 'linewidth',2);

title('x(t)');
axis([0 1 0 4]);grid;

subplot(3,1,2);
plot(t,y,'linewidth',2);
title('y(t)');
axis([1 2 0 3]);grid;
```





```
t2= 0: 0.0001: 4;
h=conv(x, y)*0.0001;

subplot(3,1,3);
plot(t2,h,'r','linewidth',2);
title('x(t)*y(t)');
axis();grid;

figure(2);
n=0: 0.1: 2;
x=4.*n.*(n<=1);
y=(-3.*n+6).*(n>=1);
[z, intarziere]=xcorr(x,y);

subplot(3,1,1);
stem(n,x);
axis([0 1 0 4]);grid;
title(['x']);

subplot(3,1,2);
stem(n,y);
axis([1 2 0 3]);grid;
title(['y']);

subplot(3,1,3);
stem(intarziere,z);
axis(); grid;
title(['z=x*y']);
```

Ex 1.



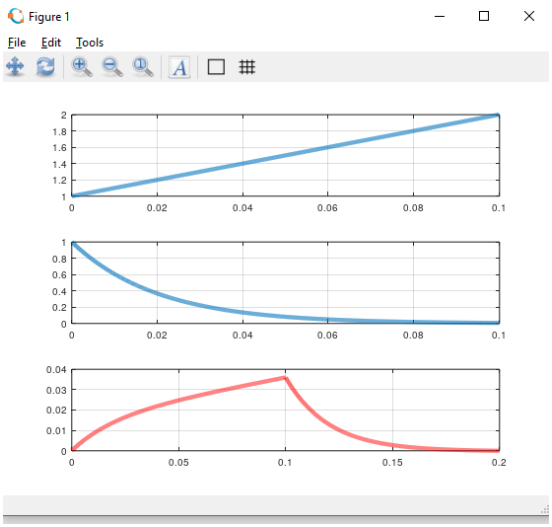

```
clc;
clear all;
close all;

tstart = 0;
tstop = 0.1;
tpas = 0.0001;

t = tstart : tpas : tstop;
x = ones(1,1001);

subplot(3, 1, 1);
plot(t, x, 'linewidth', 3);
axis([-0.101 0.201 0 1.2]); grid;

tstop3 = 0.05;
t3 = tstart : tpas : tstop3;
h = ones(1,501);
subplot(3, 1, 2);
plot(t3, h, 'linewidth', 3);
axis([-0.101 0.201 0 1.2]); grid;

t2 = 2*tstart : tpas : tstop+tstop3;
y = conv(h, x)*tpas;

subplot(3, 1, 3);
plot(t2, y, 'r', 'linewidth', 3);
```

```
axis([-0.101 0.201 ]); grid;
```

%%reprezentarea grafica a convolutiei semnalelor dreptunghiulare

%%este un trapez intrucat bazele celor doua semnale nu sunt egale

Ex 2.




```
clc;
clear all;
close all;

tstart = 0;
tstop = 0.1;
tpas = 0.0001;

f=50 %pentru o variatie exponentiala mai lina trebuie micsorata valoarea lui f

t = tstart : tpas : tstop;
x = 1+10*t; %am modificat semnul coeficientului lui t
        %pt ca semnalul sa fie crescator
subplot(3, 1, 1);
plot(t, x, 'linewidth', 3);
axis([0 0.1001 1 2]); grid;

h = 1*exp(-f*t);
subplot(3, 1, 2);
plot(t, h, 'linewidth', 3);
axis([0 0.1001 0 1]); grid;

t2 = 2*tstart : tpas : tstop*2;
```

```
y = conv(h, x) *tpas;


subplot(3, 1, 3);
plot(t2, y, 'r', 'linewidth', 3);
axis(); grid;
```