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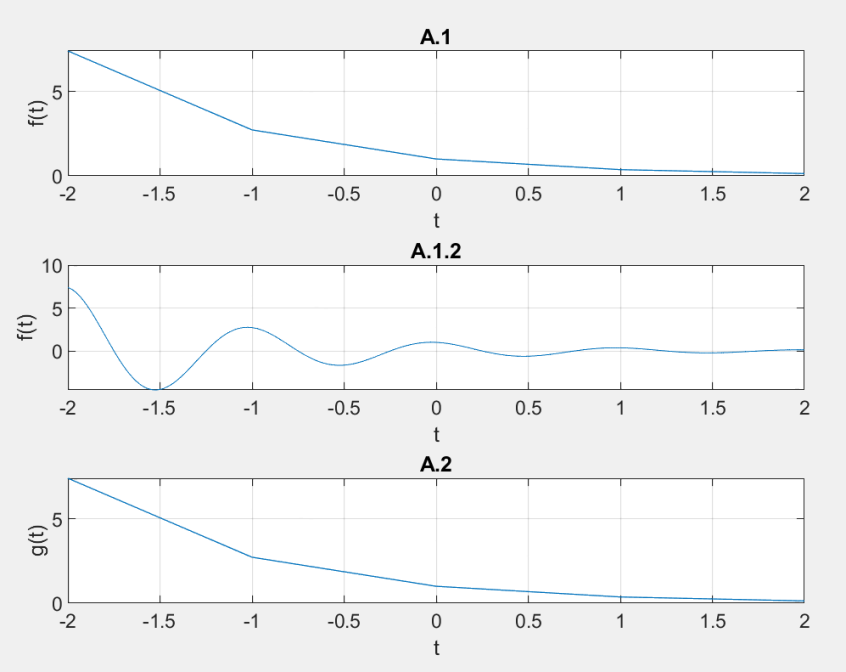


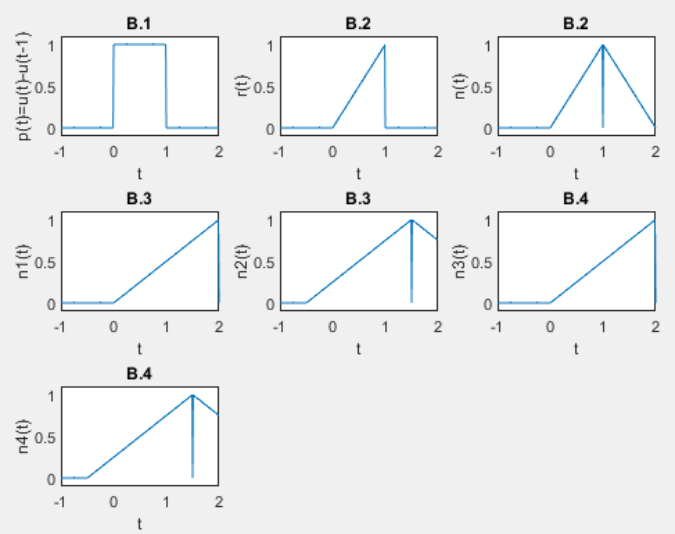
A:

These two graphs appear the same because integer time values

Appear the same because not enough points

```
f= @(t) exp(-t).*cos(2*pi*t);


subplot(3,1,1);

t=(-2:2);

plot(t,f(t));

xlabel('t');ylabel('f(t)');grid;title('A.1');


subplot(3,1,2);

t=(-2:0.01:2);

plot(t,f(t));

xlabel('t');ylabel('f(t)');grid;title('A.1.2');
```

B.



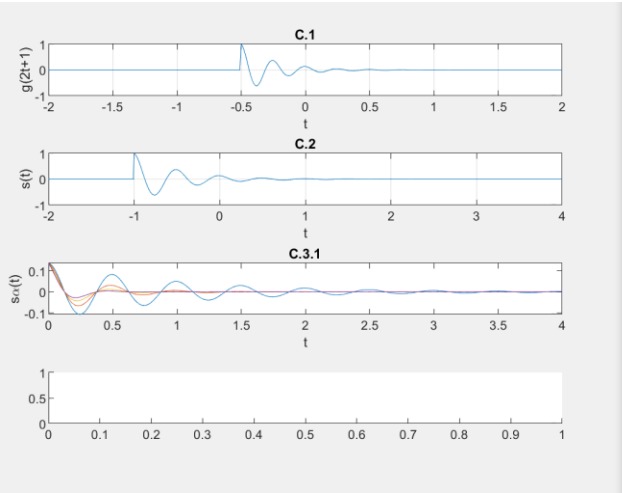

```
subplot(3,1,3);
g= @(t) exp(-t);
t=-2:2;
plot(t,g(t));

xlabel('t');ylabel('g(t)');grid;title('A.2');
u = @(t) 1.0.*(t>=0);
p = @(t) u(t)-u(t-1);

subplot(3,3,1);
 t = (-1:0.01:2);
 plot(t,p(t));
xlabel('t');ylabel('p(t)=u(t)-u(t-1)'); axis([-1 2 -.1 1.1]);title('B.1');

subplot(3,3,2);
r= @(t) t.*p(t);
plot(t,r(t));
xlabel('t');ylabel('r(t)');axis([-1 2 -.1 1.1]);title('B.2');
```

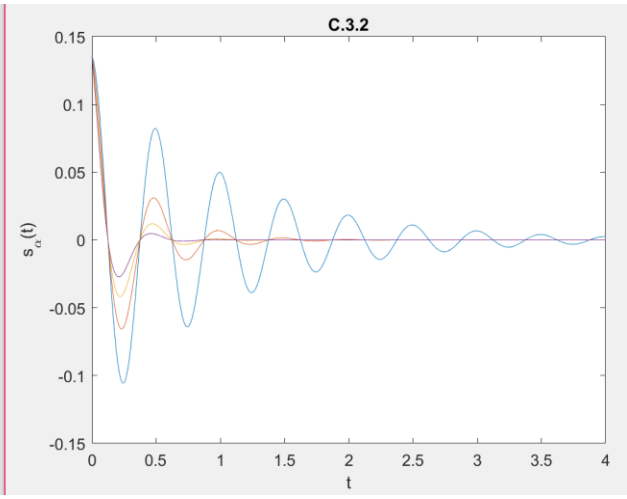
```
subplot(3,3,3);
n =@(t) r(t) + r(-t + 2);
plot(t,n(t));
xlabel('t');ylabel('n(t)');axis([-1 2 -.1 1.1]);title('B.2');

subplot(3,3,4);
n1 =@(t) n(0.5.*t);
plot(t,n1(t));
xlabel('t');ylabel('n1(t)');axis([-1 2 -.1 1.1]);title('B.3');

subplot(3,3,5);
n2 =@(t) n1(t+0.5);
plot(t,n2(t));
xlabel('t');ylabel('n2(t)');axis([-1 2 -.1 1.1]);title('B.3');

subplot(3,3,6);
n3 =@(t) n(t+0.25);
plot(t,n3(t));
xlabel('t');ylabel('n3(t)');axis([-1 2 -.1 1.1]);title('B.4');

subplot(3,3,7);
n4 =@(t) n3(t.*0.5);
plot(t,n4(t));
xlabel('t');ylabel('n4(t)');axis([-1 2 -.1 1.1]);title('B.4');
```

linear pulse r*p(t) r, t = 1 but r value is changing

the rest are shifted versions of R

C.






```
f = @(t) exp(-2*t).*cos(4*pi*t);

u = @(t) 1.0.*(t>=0);

g = @(t) f(t).*u(t);


subplot(4,1,1);

t =  (-2:0.01:2);

plot(t,g(2*t+1));

xlabel('t');ylabel('g(2t+1)'); grid;title('C.1');


subplot(4,1,2);

t = (-2:0.01:4);

s = @(t) g(t+1);

plot(t,s(t));

xlabel('t');ylabel('s(t)'); grid;title('C.2');


subplot(4,1,3);

for a = 1:2:7

   t = (0:0.01:4);

   s = @(t) exp(-2)*exp(-a*t).*cos(4*pi*t).*u(t);

   plot(t,s(t)); hold on

xlabel('t');ylabel('s{\alpha}(t)'); grid;title('C.3.1');
```

```
end


subplot(4,1,4);
t = 0:0.01:4;
alpha_num = [1, 3, 5, 7];
a = alpha_num' * ones(1,length(t));
t_matrix = ones(length(alpha_num), 1)*t;
s = @(t) exp(-2)*exp(-a.*t_matrix).*cos(4*pi*t_matrix).*(t_matrix >= 0);figure;
plot(t,s(t));hold on
xlabel('t');ylabel('s_{\alpha}(t)');title('C.3.2');
```

D:

```
A(:) % display all
A([ 2 4 7 ]) % display elem 2, 4, 7
[ A >= 0.2 ] % returns 1 for true 0 for false if elem larger than 0.2
A([ A >= 0.2 ]) %return values over 0.2 (multiplied A with the prev)
A([ A >= 0.2 ]) = 0 % turned all values over 0.2 to 0 (thus display all elem under)
```

D.2

a)

```
tic
load('ELE532_Lab1_Data.mat')
for c = 1:1024
   for d = 1:100
      if abs(B(c,d)) < 0.01
         B(c,d)=0;
      end
   end
end
B
toc
```

b)

```
load('ELE532_Lab1_Data.mat')
B([abs(B) <= 0.01])=0;
B
```

c)

lab1.m

```
tic
load('ELE532_Lab1_Data.mat')
for c = 1:1024
    for d = 1:100
        if abs(B(c,d)) < 0.01
            B(c,d)=0;
        end
    end
end
disp(B)
toc
```

Command Window

```
    1.2525   -0.5056   -0.4399   -0.8865    0.4687    0.0375    0.5816    0.8840   -0.3721   -0.2708
    0.3651   -0.3237    0.0144    0.3394    0.1958    1.6997   -0.2103   -0.5014   -0.6642   -1.2567
   -0.9189    0.9705   -0.1537    1.2772   -0.1267   -0.2584    0.2623   -1.3073   -0.1539   -1.0155
   -1.4481    0.7269   -0.8263    0.8974    2.3229    0.7746    0.8321    0.9340   -0.2510   -0.2546
   -0.1150   -1.3641   -0.1817   -0.9036   -1.0071    0.8229    2.1250   -0.6466    1.1622   -0.4025
    1.3791   -0.3996   -0.2466   -0.1429    0.8300   -0.3950   -0.2735   -0.3555   -0.1547    0.3943
   -0.2935   -0.2306    0.1266   -0.7287   -0.1125   -0.2703   -0.1545    0.6421    0.6209   -0.9972

Elapsed time is 0.141029 seconds.
>>
```

```
tic
load('ELE532_Lab1_Data.mat')
B([abs(B) <= 0.01])=0;
B
toc
```

Command Window

```
    1.2525   -0.5056   -0.4399   -0.8865    0.4687    0.0375    0.5816    0.8840   -0.3721   -0.2708
    0.3651   -0.3237    0.0144    0.3394    0.1958    1.6997   -0.2103   -0.5014   -0.6642   -1.2567
   -0.9189    0.9705   -0.1537    1.2772   -0.1267   -0.2584    0.2623   -1.3073   -0.1539   -1.0155
   -1.4481    0.7269   -0.8263    0.8974    2.3229    0.7746    0.8321    0.9340   -0.2510   -0.2546
   -0.1150   -1.3641   -0.1817   -0.9036   -1.0071    0.8229    2.1250   -0.6466    1.1622   -0.4025
    1.3791   -0.3996   -0.2466   -0.1429    0.8300   -0.3950   -0.2735   -0.3555   -0.1547    0.3943
   -0.2935   -0.2306    0.1266   -0.7287   -0.1125   -0.2703   -0.1545    0.6421    0.6209   -0.9972

Elapsed time is 0.149067 seconds.
>>
```

D.3

```
count = 0;
X =0;
for i = 1:20000
   X(i) = x_audio(i);
   if X(i) < 0
   X(i) = 0;
   count = count +1;
   end
end
disp(X);
disp(count);
sound(x_audio, 8000)
```

```
Columns 19,941 through 19,950

       0         0         0    0.0002    0.0045    0.0045    0.0022    0.0032    0.0027    0.0024

Columns 19,951 through 19,960

       0         0         0         0         0    0.0007    0.0020    0.0050    0.0034         0

Columns 19,961 through 19,970

       0         0         0    0.0002         0    0.0002    0.0027    0.0079    0.0055         0

Columns 19,971 through 19,980

       0         0    0.0022    0.0060    0.0034    0.0002    0.0024    0.0034    0.0032    0.0007

Columns 19,981 through 19,990

       0    0.0012    0.0020    0.0027    0.0012    0.0012    0.0002         0    0.0010    0.0007

Columns 19,991 through 20,000

   0.0007    0.0024    0.0010         0         0         0         0         0    0.0020    0.0007

     10015
```