```
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delay = 1; %delay
n= [0:1];
impulse = n==0;
                          %define input region[0:1]
x=n;
y=2.*x+5.*impulse;

xa=3*x;                                %define input xa
ya=2.*xa+5.*impulse;;                             %define output ya
xb=2*x;                                %define input xb
yb=2.*xb+5.*impulse;                            %define output yb
Yab=ya+yb;                             %define output yab=ya+yb
xab=xa+xb;                             %define input xab=xa+xb
yab=2.*xab+5.*impulse;                            %define output
 yab=T(xab)

subplot(4,1,1)  %origional plot
hold on
title('y with out delay ,x= [0:1]') %set the tittle
xlabel('n')                            %set label for x
ylabel('y without delay')              %set label for y
stem(0:length(n)-1,y)
hold off


subplot(4,1,2)
hold on
title('delay input(delay=1)')          %set the tittle
xlabel('n')                            %set label for x
ylabel('delay input(delay=1)')         %set label for y
n1=[zeros(1:delay) n];                 %delay =1 for input
x1=n1;
impulse1=[impulse 0];
y1=2.*x1+5.*impulse1;
stem(0:length(x)-1+delay,y1)
hold off



subplot(4,1,3)
hold on
title('delay input(delay=1)')          %set the tittle
xlabel('n')                            %set label for x
ylabel('delay input(delay=1)')         %set label for y
y2=[zeros(1,delay) y]
stem(0:length(x)-1+delay,y2)
hold off
```
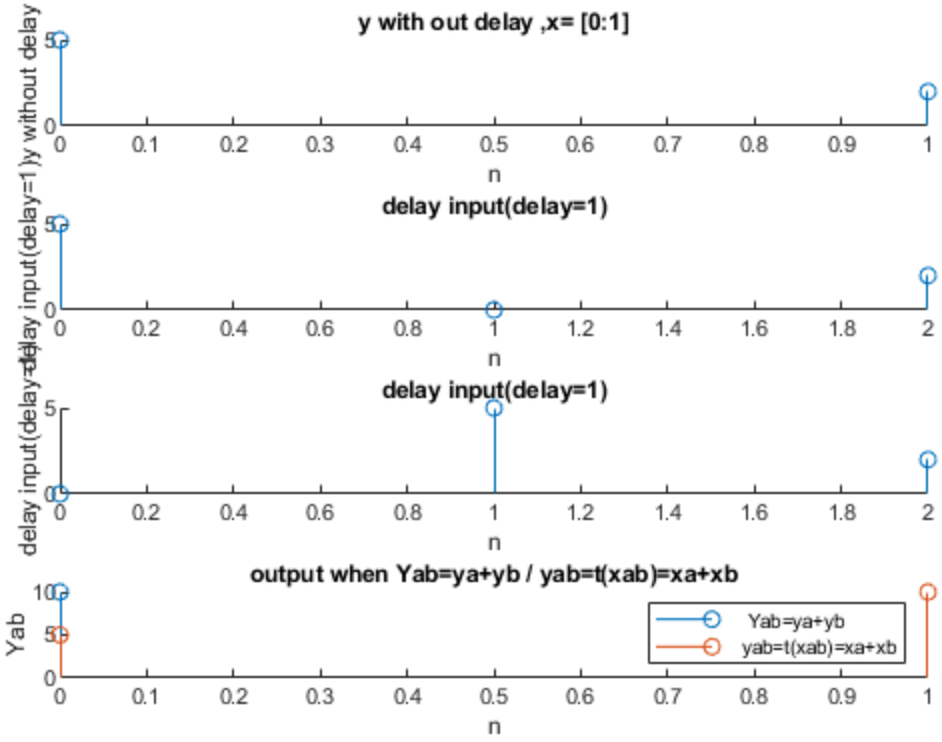
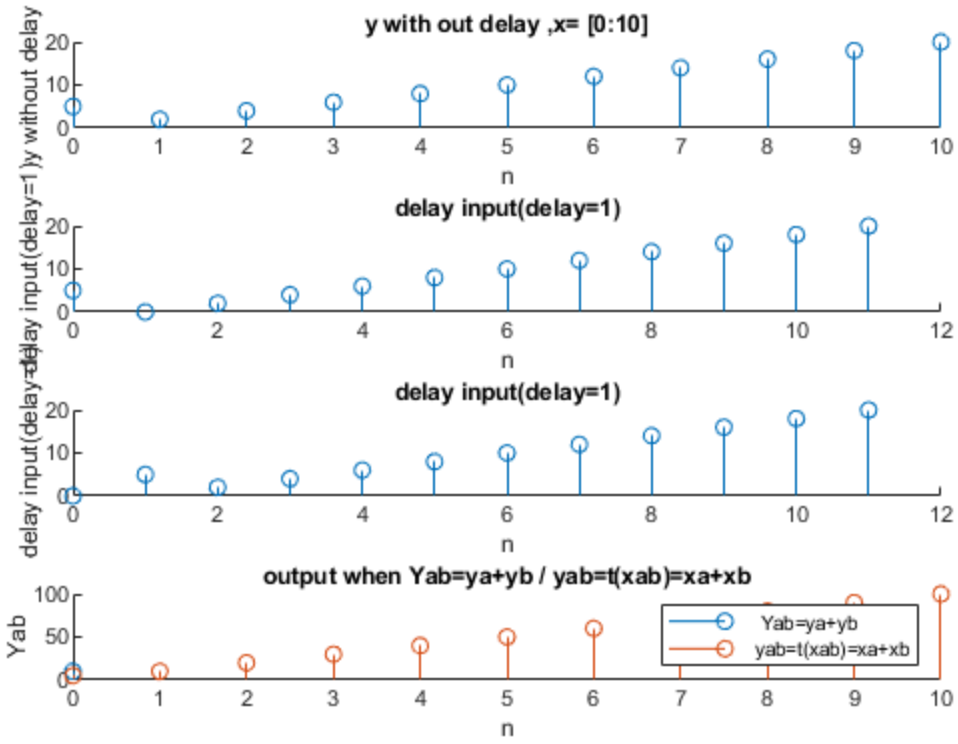

```
subplot(4,1,4)                          %origional plot
hold on
title('output when Yab=ya+yb / yab=t(xab)=xa+xb')   %set the tittle
xlabel('n')                             %set label for x
ylabel('Yab')                           %set label for y
p1=stem(0:length(x)-1,Yab);               %plot output Yab when Yab=ya+yb
p2=stem(0:length(x)-1,yab);               %plot output yab when
 yab=t(xab)=xa+xb
legend([p1 p2],' Yab=ya+yb','yab=t(xab)=xa+xb')
hold off

if(y1==y2)                              %compare the output for time
 invariant
    disp('with x= [0:1],time invariant ')
else

    disp('with x= [0:1],not time invariant ')
end


if(yab==Yab)                              %compare the output for linearty
    disp('Outputs are consistent with a linear system')
else

    disp('System is not linear ')
end


figure
n= [0:10];
impulse = n==0;
                            %define input region[0:1]
x=n;
y=2.*x+5.*impulse;

xa=3*x;                                 %define input xa
ya=2.*xa+5.*impulse;;                                %define output ya
xb=2*x;                                 %define input xb
yb=2.*xb+5.*impulse;                                  %define output yb
Yab=ya+yb;                              %define output yab=ya+yb
xab=xa+xb;                              %define input xab=xa+xb
yab=2.*xab+5.*impulse;                                %define output
 yab=T(xab)

subplot(4,1,1)  %origional plot
hold on
title('y with out delay ,x= [0:10]') %set the tittle
xlabel('n')                             %set label for x
ylabel('y without delay')               %set label for y
stem(0:length(n)-1,y)
hold off
```

```
subplot(4,1,2)
hold on
title('delay input(delay=1)')       %set the tittle
xlabel('n')                         %set label for x
ylabel('delay input(delay=1)')      %set label for y
n1=[zeros(1:delay) n];              %delay =1 for input
x1=n1;
impulse1=[impulse 0];
y1=2.*x1+5.*impulse1;
stem(0:length(x)-1+delay,y1)
hold off



subplot(4,1,3)
hold on
title('delay input(delay=1)')       %set the tittle
xlabel('n')                         %set label for x
ylabel('delay input(delay=1)')      %set label for y
y2=[zeros(1,delay) y]
stem(0:length(x)-1+delay,y2)
hold off


subplot(4,1,4)                      %origional plot
hold on
title('output when Yab=ya+yb / yab=t(xab)=xa+xb')   %set the tittle
xlabel('n')                         %set label for x
ylabel('Yab')                       %set label for y
p1=stem(0:length(x)-1,Yab);            %plot output Yab when Yab=ya+yb
p2=stem(0:length(x)-1,yab);            %plot output yab when
 yab=t(xab)=xa+xb
legend([p1 p2],' Yab=ya+yb','yab=t(xab)=xa+xb')
hold off

if(y1==y2)                          %compare the output for time
 invariant
    disp('with x= [0:10],time invariant ')
else

    disp('with x= [0:10],not time invariant ')
end


if(yab==Yab)                          %compare the output for linearty
    disp('Outputs are consistent with a linear system')
else

    disp('System is not linear ')
end


y2 =
```

```
     0     5     2

with x= [0:1],not time invariant
System is not linear

y2 =

     0     5     2     4     6     8    10    12    14    16    18
 20

with x= [0:10],not time invariant
System is not linear
```





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