```
%Assignment 3
% Done by Mahmoud Yassin Mahmoud
% ID: 202113650
% Submitted To Dr. Wail A. Mousa
% Bism Allah and I will start with
%(Q1):
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
clc;
clear;
%-----------------------------------------------------------
%defining time
n1 = -3:-1;% defining -ve range
n2 = 0:15;% defining +ve range
n =[n1 n2]; % combined range
N2 = length(n2);% length of positive range
N = length(n);
%-----------------------------------------------------------
a = [1 -0.8];% the coefficients a[k] of the output signal y(n)
b = [5];% the coefficients b[k] of the input signal x(n)
x = [zeros(1,length(n1)) 2 -3 0 2 zeros(1,N2-4)]; % the x(n) is zero padded to define it for -3=<n=<15
y = filter(b,a,x);
%-----------------------------------------------------------
% Plotting
subplot(221)
  stem(n,x);
  legend('x[n]')
     grid minor
     title('x(n) = 2\delta(n)-3\delta(n-1)+2\delta(n-3)')
     xlabel('-3< n < 15')
     ylabel('x(n)')
subplot(222)
  stem(n,y);
  legend('y(n)')
     grid minor
     title(['y(n) = 0.8y(n-1)+5x(n)'])
     xlabel('-3< n < 15')
     ylabel('y(n)')
%-----------------------------------------------------------
% creating table
n= n.';
x= x.';
y= y.';
Results = table(n,x,y)
```

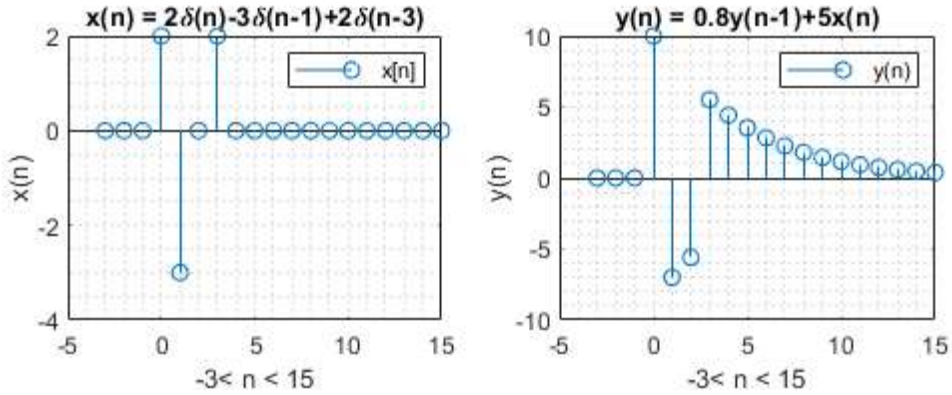
```
Results =

  19×3 table

    n     x        y
    __    __    _______

    -3     0          0
    -2     0          0
    -1     0          0
     0     2         10
     1    -3         -7
     2     0       -5.6
```

```
 3     2       5.52
 4     0      4.416
 5     0     3.5328
 6     0     2.8262
 7     0      2.261
 8     0     1.8088
 9     0      1.447
10     0     1.1576
11     0     0.9261
12     0    0.74088
13     0    0.59271
14     0    0.47416
15     0    0.37933
```



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