Signal and Image Processing

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Signal In_Class Discussed

Talking about the signal that has been discussed in class was of the form

x[-3] = 0,x[-2] = 0,x[-1]=0,x[0] = 1,x[1] = 2,x[2] = 3,x[4] = 1,x[5] = 0,x[6]=0

Step_1: Now to code the signal given above what is being done is that there is some time array x which have a step size of 1 with some change value of n.

Step_2: An empty array is being created for storing the result at every step.

Step_3: For loop is used which will iterate from 1 till the length of value of n, if-else conditions will be used to set up the result of function.

Step_4: Finally as the signal is of discrete form we are using stem inbuilt to plot the graph.

Step_5: We are going to give a title to graph and going to mark the labels.

Step_6: Now we are gonna take some shift variable which will be plotted on a seperate graph and displayed with labels.

```
clc; clear all;
n = 0 % With no delay and advancing
```

```
n = 0
```

```
x = [-5+n -4+n -3+n -2+n -1+n 0+n 1+n 2+n 3+n 4+n 5+n 6+n 7+n 8+n] % Time Array with a step siz
```

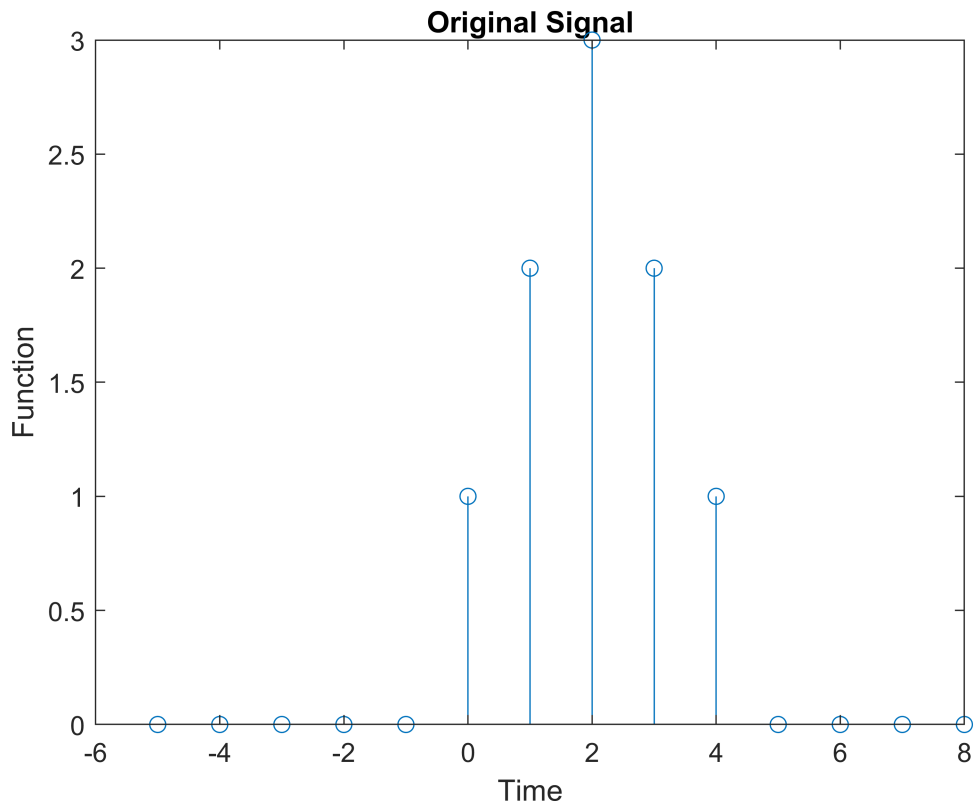
```
x = 1×14
    -5    -4    -3    -2    -1     0     1     2     3     4     5     6     7 ···
```

```
y = [] % Empty array where the output will be stored.
```

```
y =

     []
```

```
```

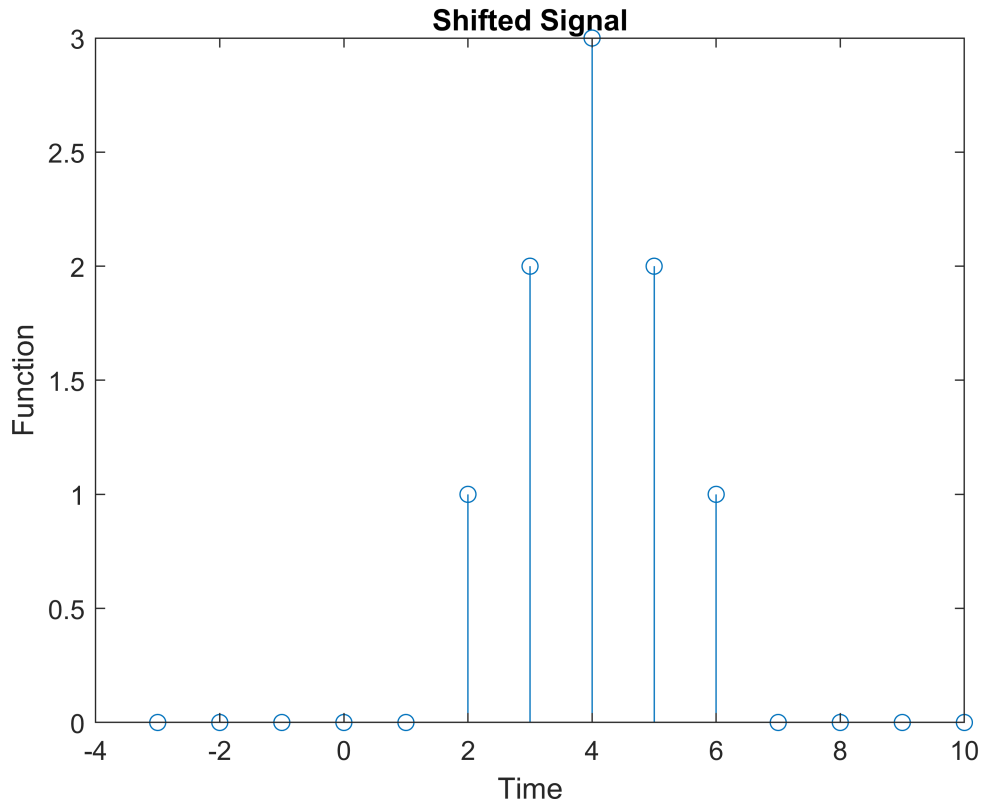
```
for i=1:length(x)
    if (x(i)<0)
        y(i)=0;
    elseif (x(i)>=0 && x(i)<=2)
            y(i)=x(i)+1;
    elseif (x(i)==3)
            y(i) = x(i)-1;
    elseif (x(i)==4)
            y(i) = 1;
    else
        y(i)=0;
    end
end

stem(x,y)
title 'Original Signal'
xlabel 'Time'
ylabel 'Function'
```




```
shift = -2  % Determining the shift whether it is delay or advancing
```

```
shift = -2
```

```
stem(x-shift,y)
title 'Shifted Signal'
xlabel 'Time'
ylabel 'Function'
```



Randomly Choosen Signal

Talking about the signal that has been discussed in class was of the form

x[-3] = any from 1 till 10,

x[-2] = any from 1 till 10,

x[-1]=0,

x[0] = 0 + any from 1 till 10,

x[1] = 1 + any from 1 till 10,

x[2] = 2 + any from 1 till 10,

x[3] = 3 + any from 1 till 10,

x[4] = 4 + any from 1 till 10,

x[5] = 5 - any from 1 till 10

x[8] = any from 1 till 10

else = 0

Step_1: Now to code the signal given above what is being done is that there is some time array x which have a step size of 1 with some change value of n.

Step_2: An empty array is being created for storing the result at every step.

Step_3: For loop is used which will iterate from 1 till the length of value of n, if-else conditions will be used to set up the result of function.

Step_4: Finally as the signal is of discrete form we are using stem inbuilt to plot the graph.

Step_5: We are going to give a title to graph and going to mark the labels.

Step_6: Now we are gonna take some shift variable which will be plotted on a seperate graph and displayed with labels.

```
clc; clear all;
n = 4
```

```
n = 4
```

```
x = [-5+n -4+n -3+n -2+n -1+n 0+n 1+n 2+n 3+n 4+n 5+n 6+n 7+n 8+n]
```

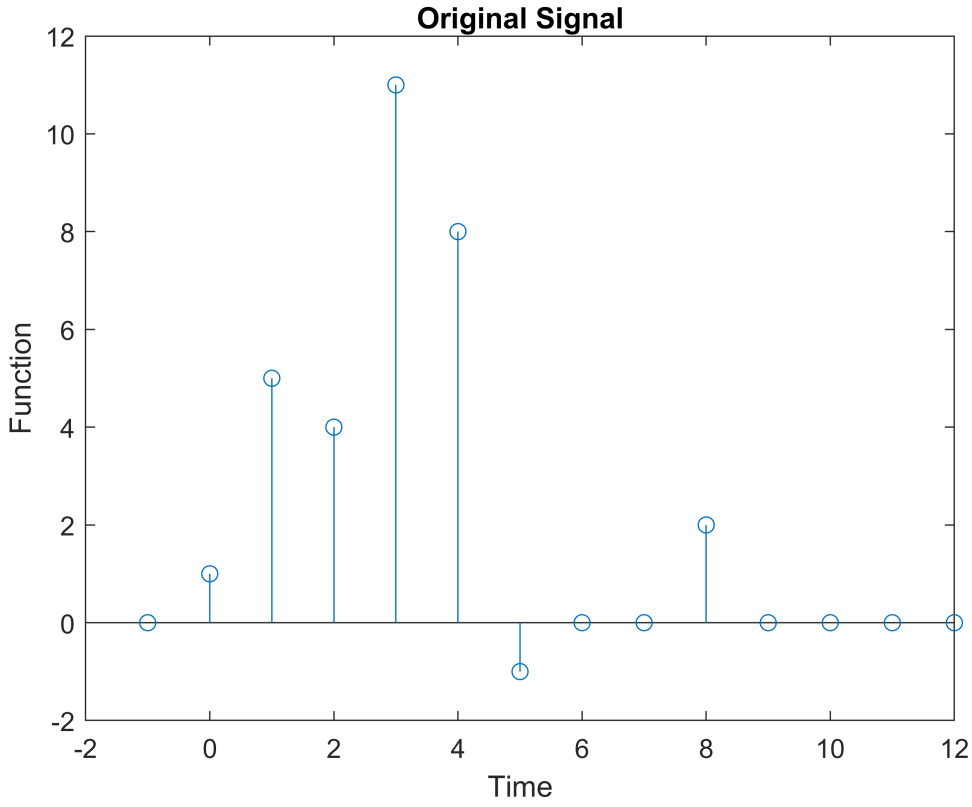
```
x = 1×14
    -1     0     1     2     3     4     5     6     7     8     9    10    11 ···
```

```
y = []
```

```
y =

     []
```

```
for i=1:length(x)
    if (x(i)<=-2)
        y(i)=randi(10);   % Randi will give a random integer from range(1,10)
    elseif (x(i)>=0 && x(i)<=4)
            y(i)=x(i)+randi(10);
    elseif (x(i)==5)
            y(i) = x(i)-randi(10);
    elseif (x(i)==8)
            y(i) = randi(10);
    else
        y(i)=0;
    end
end
```

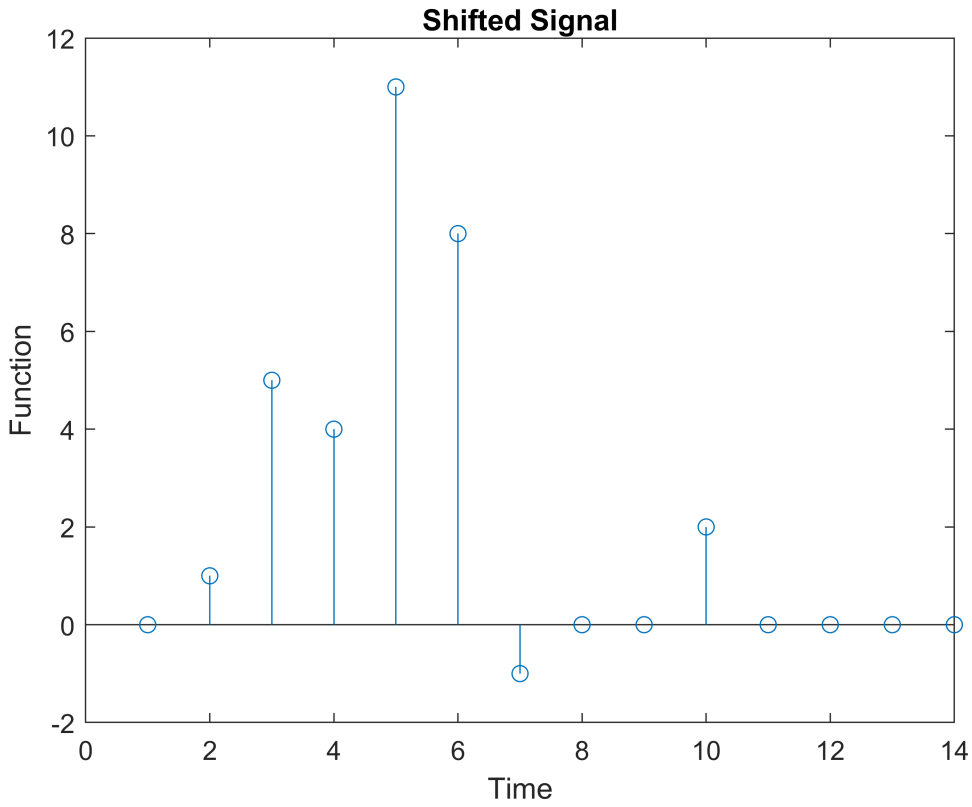
```
stem(x,y)
title 'Original Signal'
xlabel 'Time'
ylabel 'Function'
```




```
shift = -2
```

```
shift = -2
```

```
stem(x-shift,y)
title 'Shifted Signal'
xlabel 'Time'
ylabel 'Function'
```



THANK YOU!!