ESE-2014 LAB 6

Submitted by Group 11- Sruthy Krishnan(749122), Stephy Baby(753812)

A linear and time invariant system is described by the difference equation

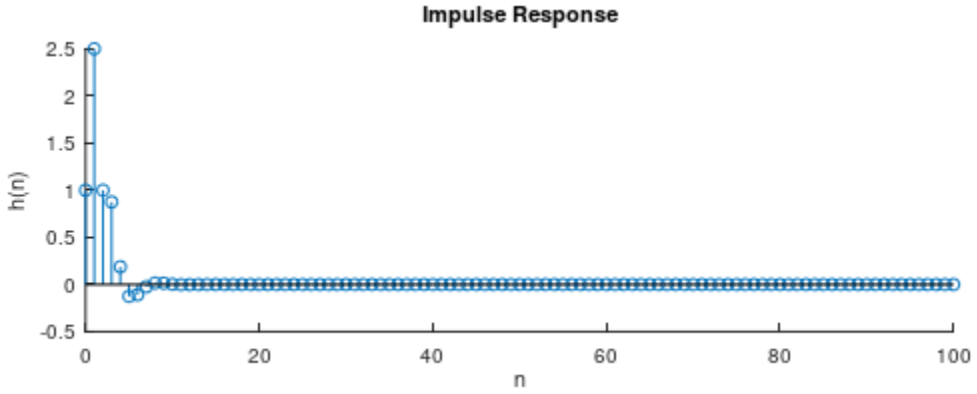
y(n)-0.5y(n-1)+0.25y(n-2)=x(n)+2x(n-1)+x(n-3)

1. Using the filter function, compute and plot impulse response of the system over 0<=n<=100.

   Operation on Sequence

```
>> b=[1 2 0 1];
>> a=[1 -0.5 0.25];
>> [x,n]= impseq(0,0,100);
>> h=filter(b,a,x);
>> subplot(2,1,1);stem(n,h); title('Impulse Response');xlabel('n');ylabel('h(n)');
>>
```

   RESULT:



2. Determine the stability of the system from this impulse response.

   Operation on Sequence

```
>> sum(abs(h))
ans =   5.8571
>>
```

   From this result, it is clear that the system is **stable.**

3. If the input to the system is x(n)=[5+3cos(0.2pi n)+4sin(0.6pi n)] u(n), determine the response of y(n) over 0<=n<=200 using the filter function.

Operation on Sequence

Command Window

```
>> b=[1 2 0 1];
>> a=[1 -0.5 0.25];
>> n=[0:200];
>> x=5*ones(size(n))+3*cos(0.2*pi*n)+4*sin(0.6*pi*n);
>> y=filter(b,a,x);
>> subplot(2,1,2);stem(n,y);title('Response Plot');xlabel('n');ylabel('y(n)');
>>
```

RESULT: