rectangular:

clc;

close all;

rp=input('enter the pass band ripple');

rs=input('enter the stop band ripple');

fp=input('enter the pass band frequency');

fs=input('enter the stop band frequency');

f=input('enter the sampling frequency');

wp=2\*fp/f;

ws=2\*fs/f;

num=-20\*log10(sqrt(rp\*rs))-13;

dem=14.6\*(fs-fp)/f;

n=ceil(num/dem);

n1=n+1;

if(rem(n,2)~=0)

n1=n;

n=n-1;

end

y=boxcar(n1);

%lowpass filter

b=fir1(n,wp,y);

[h,o]=freqz(b,1,256);

m=20\*log10(abs(h));

subplot(2,2,1);

plot(o/pi,m);

ylabel('gain in db---->');

xlabel('(a)normalized frequency-->');

%high pass filter

b=fir1(n,wp,'high',y);

[h,o]=freqz(b,1,256);

m=20\*log10(abs(h));

subplot(2,2,2);

plot(o/pi,m);

ylabel('gain in db---->');

xlabel('(b)normalized frequency-->');

%band pass filter

wn=[wp ws];

b=fir1(n,wn,y);

[h,o]=freqz(b,1,256);

m=20\*log10(abs(h));

subplot(2,2,3);

plot(o/pi,m);

ylabel('gain in db---->');

xlabel('(c)normalized frequency-->');

%band stop filter

b=fir1(n,wn,'stop',y);

[h,o]=freqz(b,1,256);

m=20\*log10(abs(h));

subplot(2,2,4);

plot(o/pi,m);

ylabel('gain in db---->');

xlabel('(b)normalized frequency-->');

output:

enter the pass band ripple0.02

enter the stop band ripple0.01

enter the pass band frequency1000

enter the stop band frequency1500

enter the sampling frequency10000

diagram:

