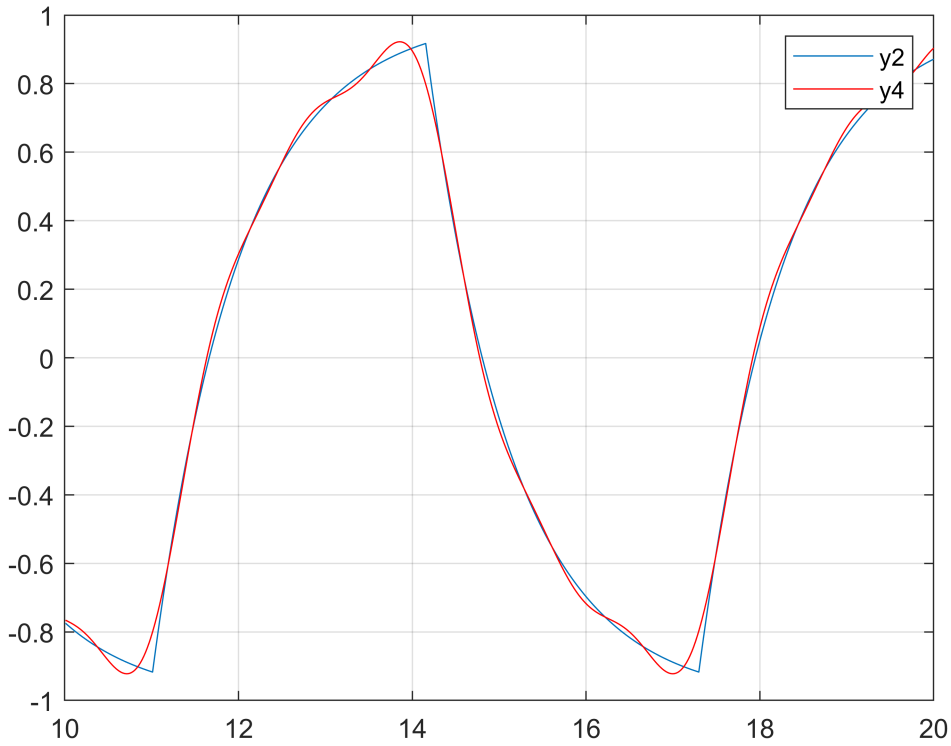
```
t=linspace(0,20,1000);
A=[1,1];%因为 H(s)=1/(1+RCs),RC=1,
B=1;%所以根据公式能知晓 A=[1,1],B=1;
apos_k=zeros(1,5);
aneg_k=zeros(1,5);
s=zeros(5,1000);
for k=(1:5)
   apos_k(k)=(1-cos(pi*k))*sin(pi*k/2)/(pi*k);
   aneg_k(k)=(1-cos(pi*(-k)))*sin(pi*(-k)/2)/(pi*(-k));
   s(k,:)=apos_k(k)*exp(1i*k*t)+aneg_k(k)*exp(1i*(-k)*t);
   y(k,:)=lsim(B,A,s(k,:),t)
end
```

```
y = 5×1000
    0.0000    0.0252    0.0500    0.0742    0.0979    0.1211    0.1438    0.1659 ⋯
         0         0         0         0         0         0         0         0
    0.0000   -0.0084   -0.0166   -0.0246   -0.0323   -0.0398   -0.0470   -0.0538
         0         0         0         0         0         0         0         0
    0.0000    0.0050    0.0099    0.0146    0.0191    0.0232    0.0270    0.0305
y = 5×1000
    0.0000    0.0252    0.0500    0.0742    0.0979    0.1211    0.1438    0.1659 ⋯
         0         0         0         0         0         0         0         0
    0.0000   -0.0084   -0.0166   -0.0246   -0.0323   -0.0398   -0.0470   -0.0538
         0         0         0         0         0         0         0         0
    0.0000    0.0050    0.0099    0.0146    0.0191    0.0232    0.0270    0.0305
y = 5×1000
    0.0000    0.0252    0.0500    0.0742    0.0979    0.1211    0.1438    0.1659 ⋯
         0         0         0         0         0         0         0         0
    0.0000   -0.0084   -0.0166   -0.0246   -0.0323   -0.0398   -0.0470   -0.0538
         0         0         0         0         0         0         0         0
    0.0000    0.0050    0.0099    0.0146    0.0191    0.0232    0.0270    0.0305
y = 5×1000
    0.0000    0.0252    0.0500    0.0742    0.0979    0.1211    0.1438    0.1659 ⋯
         0         0         0         0         0         0         0         0
    0.0000   -0.0084   -0.0166   -0.0246   -0.0323   -0.0398   -0.0470   -0.0538
         0         0         0         0         0         0         0         0
    0.0000    0.0050    0.0099    0.0146    0.0191    0.0232    0.0270    0.0305
y = 5×1000
    0.0000    0.0252    0.0500    0.0742    0.0979    0.1211    0.1438    0.1659 ⋯
         0         0         0         0         0         0         0         0
    0.0000   -0.0084   -0.0166   -0.0246   -0.0323   -0.0398   -0.0470   -0.0538
         0         0         0         0         0         0         0         0
    0.0000    0.0050    0.0099    0.0146    0.0191    0.0232    0.0270    0.0305
```

```
y4=lsim(B,A,sum(s),t);
t=linspace(0,20,1000);
x2=cos(t);
x2(x2>0)=ones(size(x2(x2>0)));
x2(x2<0)=-ones(size(x2(x2<0)));
y2=lsim(B,A,x2,t)';
plot(t(501:1000),y2(501:1000));grid on;hold on
plot(t(501:1000),y4(501:1000),'r');legend('y2','y4');
```




```
%因为 x2 的绝对值的平方在一个周期内对时间的积分小于无穷大
%所以 x2 的傅里叶级数是收敛的，故 the two responses are so similar.
```