%DMC¿ØÖÆËã·¨

clc;

clear all;

G=input('ÊäÈë´«µÝº¯ÊýG=');%ÊäÈë´«µÝº¯Êý

%ÅÐ¶ÏÊÇ·ñÎªÎÈ¶¨ÏµÍ³£¬ÈôÊÇ¿ÉÒÔ¿ØÖÆ£¬Èô²»ÊÇ£¬ÔòÎÞ·¨ÓÃDMCËã·¨½øÐÐ¿ØÖÆ

den=G.den{1};%È¡´«º¯µÄ·ÖÄ¸

p=real(roots(den));%Çó´«º¯µÄ¼«µãµÄÊµ²¿

for i=1:length(p)

r=p(i);

if r>0 %ÈôÓÐÄ³Ò»¸ö¼«µãµÄÊµ²¿µÄÊµ²¿´óÓÚÁã£¬ÔòÎª²»ÎÈ¶¨ÏµÍ³£¬DMCÎÞ·¨¿ØÖÆ

p,G %ÔÚÃüÁî´°¿ÚÏÔÊ¾¼«µãºÍ´«º¯

Error=('ÄúÒª¿ØÖÆµÄ¶ÔÏóÎª²»ÎÈ¶¨ÏµÍ³£¬DMCËã·¨Ö»ÊÊÓÃÓÚÎÈ¶¨ÏµÍ³!')

return

end

end

%ÉèÖÃDMC²ÎÊý

Ts=input('²ÉÑùÖÜÆÚ Ts= ');%²ÉÑùÊ±¼ä

P=input('Ô¤²âÊ±Óò P= ');%Ô¤²â²½³¤

M=input('¿ØÖÆÊ±Óò M= ');%¿ØÖÆ²½³¤

N=80;%½Ø¶Ï²½³¤

%Éè¶¨²Î¿¼Öµ

yr=10;

%½¨Á¢ÏµÍ³½×Ô¾ÏìÓ¦Ä£ÐÍ

[y0,t0]=step(G,0:5:500);

%³õÊ¼»¯DMC

A=zeros(P,M);%¶¯Ì¬¾ØÕó

a=zeros(N,1);

for i=1:N

a(i)=y0(i);

end

for i=1:P

for j=1:M

if i-j+1>0

A(i,j)=a(i-j+1); %¹¹Ôì¾ØÕóA

end

end

end

%³õÊ¼»¯ÏòÁ¿ys£¬y,u,eºÍ¾ØÕóA0

ys=ones(N,1);

y=zeros(N,1);

u=zeros(N,1);

e=zeros(N,1);

A0=zeros(P,N-1);

for i=1:P

for j=N-2:-1:1

if N-j+1+i-1<=N

A0(i,j)=a(N-j+1+i-1)-a(N-j+i-1);%¹¹Ôì¾ØÕóA0

else

A0(i,j)=0;

end

end

A0(i,N-1)=a(i+1);

end

%DMC³ÌÐò

for k=2:N

Uk\_1=zeros(N-1,1);

for i=1:N-1

if k-N+i<=0

Uk\_1(i)=0;

else

Uk\_1(i)=u(k-N+i);

end

end

Y0=A0\*Uk\_1;

e(k)=y(k-1)-Y0(1);

Yr=zeros(P,1);

for i=1:P

Yr(i)=yr;

end

Ek=zeros(P,1);

for i=1:P

Ek(i)=e(k);

end

delta\_u=inv(A'\*A+eye(M))\*A'\*(Yr-Y0-Ek); %¿ØÖÆÔöÁ¿µÄ¼ÆËã

for i=1:M

if k+i-1<=N

u(k+i-1)=u(k+i-1-1)+delta\_u(i); %¿ØÖÆÂÉµÄ¼ÆËã

end

end

temp=0;%ÉèÖÃÔÚk-j-1Ê±¿ÌÒÔÇ°µÄ¿ØÖÆÂÉ

for j=1:N-1

if k-j<=0

temp;

else

if k-j-1<=0

temp=temp+a(j)\*u(k-j);

else

temp=temp+a(j)\*(u(k-j)-u(k-j-1));

end

end

end

if k-N<=0

y(k)=temp+e(N);

else

y(k)=temp+a(N)\*u(k-N)+e(N);

end

end

%»­Í¼ÏÔÊ¾½á¹û

t=10\*(1:N);

subplot(211);

plot(t,y);

title('DMC¿ØÖÆÊä³öÇúÏß');

xlabel('t')

ylabel('y')

grid on

subplot(212);

plot(t,u,'r');

title('¿ØÖÆ×÷ÓÃ');

xlabel('t')

ylabel('u')

grid on