第一问：曲线拟合及topsis

Code1：小轿车制动距离与速度的关系

x0=5:5:60;

y0=[1.18,2.23,4.39,6.42,8.72,11.31,14.18,17.33,20.76,24.48,28.48,32.75];

plot(x0,y0,'r.','MarkerSize',20);

[a,p]=polyfit(x0,y0,2)

hold on

y1=polyval(a,x0)

plot(x0,y1,'g','LineWidth',1);

hold on；xlabel('速度km/h');ylabel('制动距离m');

title('小轿车制动距离与速度的关系');axis([0 65 0 35]);

ye=y0-polyval(a,x0);

ye2s=sum(ye.^2)

disp(sprintf('wucha',ye2s))

Code2：共享单车制动距离与速度的关系

x0=5:2:19;

y0=[0.8,1.1,1.45,1.85,2.34,2.79,3.3,3.85];

plot(x0,y0,'r.','MarkerSize',20);

[a,p]=polyfit(x0,y0,2)

hold on

y1=polyval(a,x0)

plot(x0,y1,'g','LineWidth',1);

hold on

xlabel('速度km/h');

ylabel('制动距离');

title('共享单车制动距离与速度的关系');

axis([4 20 0 4]);

ye=y-polyval(a,x);

ye2s=sum(ye.^2);

disp(sprintf('wucha',ye2s));

Code3：topsis

x=[0.2545,2.508,0.8,0.934,0.97,1.6891;

0.2365,2.508,1,0.934,0.97,1.031;

0.254,5.12,0.2,0.915,1,2.000;

0.1255,21.4,0.4,0.981,0.95,1.1905;

0.0676,7.165,1,0.986,0.4,0.209];

[m,n]=size(x);

for i=1:n

y(:,i)=x(:,i)/sum([x(:,i).^2])

end

for i=1:n

wmin(i)=max(y(:,i)); %×î´óÖ¸±ê

wmax(i)=min(y(:,i)); %×îÐ¡Ö¸±ê

end

d1=zeros(m,1);

d2=zeros(m,1);

for i=1:m

for j=1:n

diszy(i,j)=(y(i,j)-wmin(j))^2 %¼ÆËãµ½×îÓÅÖµ¾àÀë

diszl(i,j)=(y(i,j)-wmax(j))^2 %¼ÆËãµ½×îÓÅÖµ¾àÀë

d1(i,1)=d1(i,1)+diszy(i,j);

d2(i,1)=d2(i,1)+diszl(i,j);

end

d1(i,1)=sqrt(d1(i,1)); %Çód+

d2(i,1)=sqrt(d2(i,1)); %Çód-

end

for i=1:m

c(i)=d2(i,1)/(d(i,1)+d2(i,1)); %ÇócÖµ

end

第二问：图论（最短路），目标规划

A=xlsread(‘lingjiejuzhen.xlsx’);

[D,path]=floydd(A)

%%最短路求最短路径

function [D,path]=floydd(A)

n=size(A,1);

D=A;

path=zeros(n,n);

for i=1:n

for j=1:n

if D(i,j)~=inf

path(i,j)=j;

end

end

end

for k=1:n

for i=1:n

for j=1:n

if D(i,k)+D(k,j)<D(i,j)

D(i,j)=D(i,k)+D(k,j);

path(i,j)=path(i,k);

end

end

end

end

end

! 选几个投放点;

model:

sets:

p/1..24/:c;

m(p,p):v,x;

endsets

data:

v=@ole('F\pip.xlsx','distance');

enddata

min z=@sum(p:c);

@for(p(i): @sum(p(j):x(i,j))=1);

@for(m(i,j):v(i,j)\*x(i,j)<=25);

@for(m(i,j):x(i,j)<=c(j));

@for(m: @bin(x));

@for(p:@bin(c));

End

%%求投放点：

clc;clear all;close all;

n=24;

a=a+a';

M=max(max(a))\*n^2;

d=a+((a==0)-eye(n))\*M;

path=zeros(n);

for k=1:n

for i=1:n

for j=1:n

if d(i,j)>d(i,k)+d(k,j)

d(i,j)=d(i,k)+d(k,j);

path(i,j)=k;

end

end

end

end

L=[];L1=[];L2=[];S=[];

c=1;

for x=1:24

for y=1:24

for z=1:24

for n=1:24

L(1)=d(n,x);

L(2)=d(n,y);

L(3)=d(n,z);

L1(n)=min(L);

end

b=1:n;

if (L1(b)<=25)

L2(1)=x;

L2(2)=y;

L2(3)=z;

wz{c}=L2;

S(c)=sum(L1);

c=c+1;

end

end

end

end

c=find(S==min(S));

wz=wz{c(1)};

fprintf( 'toufangdidian:');disp(wz)

%%简化待投放点地图

clc;clear all;close all;

x=xlsread('data.xlsx','Sheet1','A1:A24');

y=xlsread('data.xlsx','Sheet1','B1:B24');

axes('linewidth',1, 'box', 'on', 'FontSize',16);

plot(x(1),y(1),'ro','MarkerSize',10,'MarkerFaceColor','r');hold on;

text(x(1),y(1),'ÄÏ²Ù','fontsize',10','fontWeight','Bold','fontAngle','italic')

plot(x(2),y(2),'go','MarkerSize',10,'MarkerFaceColor','g');hold on;

text(x(2),y(2),'¶¡Ïã11 12 13','fontsize',10','fontWeight','Bold','fontAngle','italic')

plot(x(3),y(3),'go','MarkerSize',10,'MarkerFaceColor','g');hold on;

text(x(3),y(3),'¶¡Ïã14 15','fontsize',10','fontWeight','Bold','fontAngle','italic')

plot(x(4),y(4),'ro','MarkerSize',10,'MarkerFaceColor','r');hold on;

text(x(4),y(4),'±±²Ù','fontsize',10','fontWeight','Bold','fontAngle','italic')

plot(x(5),y(5),'mo','MarkerSize',10,'MarkerFaceColor','m');hold on;

text(x(5),y(5),'º£ÌÄ²ÍÌü','fontsize',10','fontWeight','Bold','fontAngle','italic')

plot(x(6),y(6),'mo','MarkerSize',10,'MarkerFaceColor','m');hold on;

text(x(6),y(6),'º£ÌÄ5 6','fontsize',10','fontWeight','Bold','fontAngle','italic')

plot(x(7),y(7),'co','MarkerSize',10,'MarkerFaceColor','c');hold on;

text(x(7),y(7),'ÖñÔ°1 2','fontsize',10','fontWeight','Bold','fontAngle','italic')

plot(x(8),y(8),'co','MarkerSize',10,'MarkerFaceColor','c');hold on;

text(x(8),y(8),'ÖñÔ°3 4','fontsize',10','fontWeight','Bold','fontAngle','italic')

plot(x(9),y(9),'gh','MarkerSize',10,'MarkerFaceColor','g');hold on;

text(x(9),y(9),'×ÛºÏÂ¥','fontsize',10','fontWeight','Bold','fontAngle','italic')

plot(x(10),y(10),'ys','MarkerSize',10,'MarkerFaceColor','r');hold on;

text(x(10),y(10),'A BÂ¥','fontsize',10','fontWeight','Bold','fontAngle','italic')

plot(x(11),y(11),'ys','MarkerSize',10,'MarkerFaceColor','y');hold on;

text(x(11),y(11),'C DÂ¥','fontsize',10','fontWeight','Bold','fontAngle','italic')

plot(x(12),y(12),'ys','MarkerSize',10,'MarkerFaceColor','y');hold on;

text(x(12),y(12),'GÂ¥','fontsize',10','fontWeight','Bold','fontAngle','italic')

plot(x(13),y(13),'bp','MarkerSize',10,'MarkerFaceColor','b');hold on;

text(x(13),y(13),'¶«ÃÅ','fontsize',10','fontWeight','Bold','fontAngle','italic')

plot(x(14),y(14),'gd','MarkerSize',10,'MarkerFaceColor','g');hold on;

text(x(14),y(14),'Í¼Êé¹Ý','fontsize',10','fontWeight','Bold','fontAngle','italic')

plot(x(15),y(15),'ys','MarkerSize',10,'MarkerFaceColor','y');hold on;

text(x(15),y(15),'ÐÅÔ¶','fontsize',10','fontWeight','Bold','fontAngle','italic')

plot(x(16),y(16),'gd','MarkerSize',10,'MarkerFaceColor','g');hold on;

text(x(16),y(16),'¼ÒÊôÇø','fontsize',10','fontWeight','Bold','fontAngle','italic')

plot(x(17),y(17),'ys','MarkerSize',10,'MarkerFaceColor','y');hold on;

text(x(17),y(17),'FÂ¥','fontsize',10','fontWeight','Bold','fontAngle','italic')

plot(x(18),y(18),'gd','MarkerSize',10,'MarkerFaceColor','g');hold on;

text(x(18),y(18),'¹¤Ñµ','fontsize',10','fontWeight','Bold','fontAngle','italic')

plot(x(19),y(19),'gd','MarkerSize',10,'MarkerFaceColor','g');hold on;

text(x(19),y(19),'Ð£Ò½Ôº','fontsize',10','fontWeight','Bold','fontAngle','italic')

plot(x(20),y(20),'bp','MarkerSize',10,'MarkerFaceColor','b');hold on;

text(x(20),y(20),'±±ÃÅ','fontsize',10','fontWeight','Bold','fontAngle','italic')

plot(x(21),y(21),'mo','MarkerSize',10,'MarkerFaceColor','m');hold on;

text(x(21),y(21),'º£ÌÄ8 9','fontsize',10','fontWeight','Bold','fontAngle','italic')

plot(x(22),y(22),'gd','MarkerSize',10,'MarkerFaceColor','g');hold on;

text(x(22),y(22),'´ó»î','fontsize',10','fontWeight','Bold','fontAngle','italic')

plot(x(23),y(23),'gh','MarkerSize',10,'MarkerFaceColor','g');hold on;

text(x(23),y(23),'Èó³Ç','fontsize',10','fontWeight','Bold','fontAngle','italic')

plot(x(24),y(24),'gd','MarkerSize',10,'MarkerFaceColor','g');hold on;

text(x(24),y(24),'ÐÐÕþÂ¥','fontsize',10','fontWeight','Bold','fontAngle','italic')

xlabel('ºáÖá')

xlabel('×ÝÖá')

title('Î÷°²µç×Ó¿Æ¼¼´óÑ§¹²Ïíµ¥³µÍ¶·Åµã')

%%人口饼形图

x0=1:1:24;

y0=[6.2 16.7 11.3 11.5 14.1 12.4 10.4 14.5 15.6 36.8 22.7 9.8 6.3 22.6 23.5 8.5 10.6 7.7 2.3...

6.5 12.7 13.9 2.8 7.2];figure(1)

b = bar(data,'b');hold on

ch = get(b,'children');hold on

set(gca,'XTickLabel',{'1','2','3','4','5','6','7','8','9','10','11','12''13','14','15','16','17','18','19','20','21','22','23','24'});hold on

set(ch,'FaceVertexCData',[0 0 1;0 1 1;1 1 1;1 0 1;0 0 1;0 1 1;1 1 1;1 0 1;0 0 1;0 1 1;1 1 1;1 0 1;0 0 1;0 1 1;1 1 1;1 0 1;0 0 1;0 1 1;1 1 1;1 0 1;0 0 1;0 1 1;1 1 1;1 0 1;0 0 1;0 1 1;1 1 1;1 0 1;0 0 1;0 1 1;1 1 1;1 0 1;])

%%第四问 灰色预测

clc;clear all;close all;

t0=[21 46 103 104 216 304 380 496]';

t1=cumsum(t0);

n=length(t1);

lamda=t0(1:n-1)./t0(2:n);

range=minmax(lamda)

[exp(-2/(n+1)) exp(2/(n+2))]

B=[-0.5\*(t1(1:end-1)+t1(2:end)),ones(n-1,1)];

Y=t0(2:end);

r=B\Y

y=dsolve('Dy+a\*y=b','y(0)=y0');

y=subs(y,{'a','b','y0'},{r(1),r(2),t1(1)});

yuce1=subs(y,'t',[0:n+8]);

vpa(yuce1)

a = zeros(1, n+8);a(1) = yuce1(1);

for i = 2:n+8

a(i) = yuce1(i)-yuce1(i-1);

end

a;

figure, plot(1:8,t0,'b',8:16,[t0(end) a(9:end)],'r')

digits(9),y=vpa(y)

yuce=diff(yuce1); yuce=[t0(1),yuce]

epsilon = (t0' - a(1:8))./t0'

avg\_e = 1/(n-1)\*sum(abs(epsilon))

p=(1-avg\_e)

%%bp神经网络1

Clc;clear all;close all;

x=xlsread('bp.xlsx','Sheet1');

x=x(1:8,1:6);

p=x';%ÊäÈë¾ØÕó

y=xlsread('bp.xlsx','Sheet1');

y=y(1:8,7);t=y';

[pn,minp,maxp,tn,mint,maxt]=premnmx(p,t);

dx=[-1,1;-1,1;-1,1;-1,1;-1,1;-1,1]; %¹éÒ»»¯´¦Àíºó×îÐ¡ÖµÎª-1£¬×î´óÖµÎª 1

%BP ÍøÂçÑµÁ·

net=newff(dx,[6,5,1],{'tansig','tansig','purelin'},'traingdx'); % ½¨ Á¢ Ä£ÐÍ£¬²¢ÓÃÌÝ¶ÈÏÂ½µ·¨ÑµÁ·£®

net.trainParam.show=10000; %1000 ÂÖ»ØÏÔÊ¾Ò»´Î½á¹û

net.trainParam.Lr=0.05; %Ñ§Ï°ËÙ¶ÈÎª 0.05

net.trainParam.epochs=50000; %×î´óÑµÁ·ÂÖ»ØÎª 50000 ´Î

net.trainParam.goal=0.065\*10^(-2); %¾ù·½Îó²î

net=train(net,pn,tn); %¿ªÊ¼ÑµÁ·£¬ÆäÖÐ pn,tn ·Ö±ðÎªÊäÈëÊä³öÑù±¾

%ÀûÓÃÔ­Ê¼Êý¾Ý¶Ô BP ÍøÂç·ÂÕæ

an=sim(net,pn); %ÓÃÑµÁ·ºÃµÄÄ£ÐÍ½øÐÐ·ÂÕæ

a=postmnmx(an,mint,maxt); % °Ñ·ÂÕæµÃµ½µÄÊý¾Ý»¹Ô­ÎªÔ­Ê¼µÄÊýÁ¿¼¶£»

pnew=xlsread('yuceshuju1.xlsx','Sheet1');

pnew=pnew(9:16,1:6);

pnew=pnew'

pnewn=tramnmx(pnew,minp,maxp); %ÀûÓÃÔ­Ê¼ÊäÈëÊý¾ÝµÄ¹éÒ»»¯²ÎÊý¶ÔÐÂÊý¾Ý½øÐÐ¹éÒ»»¯£»

anewn=sim(net,pnewn); %ÀûÓÃ¹éÒ»»¯ºóµÄÊý¾Ý½øÐÐ·ÂÕæ£»

anew=postmnmx(anewn,mint,maxt) %°Ñ·ÂÕæµÃµ½µÄÊý¾Ý»¹Ô­ÎªÔ­Ê¼µÄÊýÁ¿¼¶£»

a=a';

bp神经网络单因子

clear all,clc;

x=xlsread('bp.xlsx','sheet1','A1:A8');

lag=3; % ×Ô»Ø¹é½×Êý

iinput=x; % xÎªÔ­Ê¼ÐòÁÐ£¨ÐÐÏòÁ¿£©

n=length(iinput);

%×¼±¸ÊäÈëºÍÊä³öÊý¾Ý

inputs=zeros(lag,n-lag);

for i=1:n-lag

inputs(:,i)=iinput(i:i+lag-1)';

end

targets=x(lag+1:end);

%´´½¨ÍøÂç

hiddenLayerSize = 5; %Òþ²Ø²ãÉñ¾­Ôª¸öÊý

net = fitnet(hiddenLayerSize);

% ±ÜÃâ¹ýÄâºÏ£¬»®·ÖÑµÁ·£¬²âÊÔºÍÑéÖ¤Êý¾ÝµÄ±ÈÀý

net.divideParam.trainRatio = 70/100;

net.divideParam.valRatio = 15/100;

net.divideParam.testRatio = 15/100;

%ÑµÁ·ÍøÂç

[net,tr] = train(net,inputs,targets);

%% ¸ù¾ÝÍ¼±íÅÐ¶ÏÄâºÏºÃ»µ

yn=net(inputs);

errors=targets-yn;

figure, ploterrcorr(errors) %»æÖÆÎó²îµÄ×ÔÏà¹ØÇé¿ö£¨20lags£©

figure, parcorr(errors) %»æÖÆÆ«Ïà¹ØÇé¿ö

%[h,pValue,stat,cValue]= lbqtest(errors) %Ljung£­Box Q¼ìÑé£¨20lags£©

figure,plotresponse(con2seq(targets),con2seq(yn)) %¿´Ô¤²âµÄÇ÷ÊÆÓëÔ­Ç÷ÊÆ

%figure, ploterrhist(errors) %Îó²îÖ±·½Í¼

%figure, plotperform(tr) %Îó²îÏÂ½µÏß

%% ÏÂÃæÔ¤²âÍùºóÔ¤²â¼¸¸öÊ±¼ä¶Î

fn=8; %Ô¤²â²½ÊýÎªfn¡£

f\_in=iinput(n-lag+1:end)';

f\_out=zeros(1,fn); %Ô¤²âÊä³ö

% ¶à²½Ô¤²âÊ±£¬ÓÃÏÂÃæµÄÑ­»·½«ÍøÂçÊä³öÖØÐÂÊäÈë

for i=1:fn

f\_out(i)=net(f\_in)

end