## 问题(1)

sheng=shaperead('counties\_china.shp', 'UseGeoCoords', true); chengdu=sheng(2333:2345);

boundall=[]; name=cell(13,1);

for i=1:length(chengdu) boundall=[boundall;chengdu(i).BoundingBox]; name{i}=chengdu(i).LAST\_NAME9;

end

name{1}='成都';

name{2}='金堂';

name{3}='双流';

name{4}='温江';

name{6}='新都';

name{7}='大邑';

name{8}='浦江';

name{9}='新津';

name{10}='都江堰';

name{11}='彭州';

name{12}='邛崃';

name{13}=' 崇 州 '; minlon=min(boundall(:,1));%min(chengdu.Lon); maxlon=max(boundall(:,1));%max(chengdu.Lon); minlat=min(boundall(:,2));%min(chengdu.Lat); maxlat=max(boundall(:,2));%max(chengdu.Lat); dataall=[];

for i=1:24

data=dlmread(['cityID510100realDate20150909\_',num2str(i),'\_t.txt']);

end

tlen=length(data); nump=tlen/3; datat=zeros(nump,3); datat(:,1)=data(1:3:tlen);

datat(:,2)=data(2:3:tlen);

datat(:,3)=data(3:3:tlen);

cancel=datat(:,1)>maxlon | datat(:,1)<minlon | datat(:,2)>maxlat | datat(:,2)<minlat; datat(cancel,:)=[];

dataall(i).taxi=datat; data=dlmread(['cityID510100realDate20150909\_',num2str(i),'\_p.txt']); tlen=length(data);

nump=tlen/3; datap=zeros(nump,3); datap(:,1)=data(1:3:tlen);

datap(:,2)=data(2:3:tlen);

datap(:,3)=data(3:3:tlen);

cancel=datap(:,1)>maxlon | datap(:,1)<minlon | datap(:,2)>maxlat | datap(:,2)<minlat; datap(cancel,:)=[];

dataall(i).passenger=datap;

%plot fignum=[]; eachfignum=1; for i=1:24

datat=dataall(i).taxi; datap=dataall(i).passenger; if mod(i-1,eachfignum)==0

k=ceil(i/eachfignum); hfig=figure(k);

fignum=[fignum,hfig]; if eachfignum==1

set(gcf,'PaperType','A4', ... 'paperOrientation', 'portrait', ...

'paperunits','CENTIMETERS','PaperPosition',[.00, .00,10,8]);

end

else

end

set(gcf,'PaperType','A4', ... 'paperOrientation', 'portrait', ...

'paperunits','CENTIMETERS','PaperPosition',[.00, .00,21,29]);

if eachfignum>1

subplot(ceil(eachfignum/2),2,mod(i,eachfignum)\*(mod(i,eachfignum)~=0)+eachfignum\*(mo d(i,eachfignum)==0))

end geoshow(chengdu);

title([num2str(i),'点;黄-成都;绿-出租;红-乘客'])

hold on scatter(datat(:,1),datat(:,2),datat(:,3),'filled','o','g')

scatter(datap(:,1),datap(:,2),datap(:,3),'filled','s','r') title([num2str(i),'点;成都;绿-出租;红-乘客']) xlabel('经度')

ylabel('纬度')

for kk=1:length(chengdu)

text(mean(chengdu(kk).BoundingBox(:,1)),mean(chengdu(kk).BoundingBox(:,2)),name(kk)); end

hold off

if mod(i-1,eachfignum)==0 figname=strcat('chengdu\_part',num2str(k),'.jpg');

end

end

saveas(hfig, figname, 'jpg');

savefig(fignum,'chengdu.fig') close all figs=openfig('chengdu.fig'); for k=1:length(fignum)

figname=strcat('chengdu\_part',num2str(k),'.jpg'); saveas(figs(k), figname, 'jpg');

end close all

%mean plot meanall=[]; for i=1:24

meanall=[meanall;[mean(dataall(i).taxi(:,3)),mean(dataall(i).passenger(:,3))]];

end h=1:24;

set(gcf,'PaperType','A4', ... 'paperOrientation', 'portrait', ...

'paperunits','CENTIMETERS','PaperPosition',[.00, .00,16,10]); [hAx,hLine1,hLine2]=plotyy(h,meanall(:,1),h,meanall(:,2)); ylabel(hAx(1),'出租车均值')

ylabel(hAx(2),'乘客均值')

set(hLine1,'LineStyle','--','Marker','\*','MarkerSize',6,'LineWidth',1.5)

set(hLine2,'LineStyle',':','Marker','o','MarkerSize',6,'LineWidth',1.5) xtlabel=num2cell(h);%cat(2,num2cell(h(1:4:end-2)),method); set(hAx,'XTick',h,'XTickLabel',xtlabel,'xlim',[1,24])

grid on xlabel('时间')

leglabel={'出租车均值','乘客需求均值'};

legend(leglabel,'Location','Best')

title('成都市 2015 年 9 月 9 日全天出租车分布和乘客需求均值图') figname=strcat('chengdu\_mean','.jpg');

saveas(gcf, figname, 'jpg');

%matching C0=[0.1:0.1:0.9,1:50];

lc0=length(C0); match=[]; matchall=[]; matchpoint=[]; for i=1:24

p0=dataall(i).passenger; lp0=size(p0,1); t0=dataall(i).taxi; r=size(t0,1); disp=zeros(lp0,lc0);

for j=1:lp0

p00=ones(r,1)\*p0(j,1:2); d=dis(p00(:,1),p00(:,2),t0(:,1),t0(:,2));

for k=1:lc0

ts=sum(t0(d<=C0(k),3)); if ts<p0(j,3)

disp(j,k)=1; elseif ts>p0(j,3)

disp(j,k)=-1;

end

end

else

end

disp(j,k)=0;

end

idx=ones(lp0,1)\*(1:lc0); idx(disp>0)=inf; idxsel=min(idx,[],2); idxsel(isinf(idxsel))=C0(end); match(i).loc=p0(:,1:2); match(i).matchp=disp; match(i).matchpstats=idxsel;

matchall=[matchall;[i\*ones(lp0,1),p0(:,1:2),disp,idxsel]]; matchpoint=[matchpoint,lp0];

mathpointcum=cumsum(matchpoint); newtime=zeros(size(matchall,1),1); newtime(ismember(matchall(:,1),[8,9]))=1;

newtime(ismember(matchall(:,1),[18,19]))=2;

newtime(ismember(matchall(:,1),[7,10:17]))=3; newtime(ismember(matchall(:,1),20:22))=4; newtime(ismember(matchall(:,1),[1:6,23:24]))=5;

%plot fignum=[]; eachfignum=1; for i=1:24

loc=match(i).loc; measure=match(i).matchpstats; if mod(i-1,eachfignum)==0

k=ceil(i/eachfignum); hfig=figure(k);%figure(i);%figure(ceil(i/6));% fignum=[fignum,hfig];

if eachfignum==1 set(gcf,'PaperType','A4', ...

'paperOrientation', 'portrait', ...

end

else

end

'paperunits','CENTIMETERS','PaperPosition',[.00, .00,10,8]);

set(gcf,'PaperType','A4', ... 'paperOrientation', 'portrait', ...

'paperunits','CENTIMETERS','PaperPosition',[.00, .00,21,29]);

if eachfignum>1

subplot(ceil(eachfignum/2),2,mod(i,eachfignum)\*(mod(i,eachfignum)~=0)+eachfignum\*(mo d(i,eachfignum)==0))

end

geoshow(chengdu); % 此处用 mapshow 投影会不正确

hold on scatter(loc(:,1),loc(:,2),measure,'filled','s','b') title([num2str(i),'点;成都;蓝-打车难易程度;']) xlabel('经度')

ylabel('纬度')

for kk=1:length(chengdu)

text(mean(chengdu(kk).BoundingBox(:,1)),mean(chengdu(kk).BoundingBox(:,2)),name(kk)); end

hold off

if mod(i-1,eachfignum)==0 figname=strcat('chengdupipei\_part',num2str(k),'.jpg'); saveas(hfig, figname, 'jpg');

end

end

savefig(fignum,'chengdupipei.fig') close all figs=openfig('chengdupipei.fig');

for k=1:length(fignum) figname=strcat('chengdupipei\_part',num2str(k),'.jpg'); saveas(figs(k), figname, 'jpg');

end close all

%%%所有时点乘客打车难易度散点set(gcf,'PaperType','A4', ...

'paperOrientation', 'portrait', ... 'paperunits','CENTIMETERS','PaperPosition',[.00, .00,16,14]);

plot(matchall(:,end),'\*') xlabel('乘客数据点') ylabel('邻域半径(km)')

title('所有时点乘客打车难易度')

set(gca,'YTick',1:5:lc0) xtlabel=cat(2,num2cell(C0(1:5:lc0))); set(gca,'YTickLabel',xtlabel)

axis tight grid on

figname=strcat('chengdupipei\_scatter','.jpg'); saveas(gcf, figname, 'jpg');

%%%所有时点乘客打车难易度分布

set(gcf,'PaperType','A4', ... 'paperOrientation', 'portrait', ...

'paperunits','CENTIMETERS','PaperPosition',[.00, .00,16,14]); geoshow(chengdu);

hold on scatter(matchall(:,1),matchall(:,2),matchall(:,end),'filled','s','b') title('所有时点;成都;蓝-打车难易程度;')

xlabel('经度')

ylabel('纬度')

for kk=1:length(chengdu)

text(mean(chengdu(kk).BoundingBox(:,1)),mean(chengdu(kk).BoundingBox(:,2)),name(kk)); end

hold off figname=strcat('chengdupipei\_all','.jpg'); saveas(gcf, figname, 'jpg');

## %问题(3)方案 1 time=8;

op=dataall(time).passenger;%选择 8 点的乘客数据

lp0=size(op,1); ebt=10;%每天补贴 1 元

lbt=30;%补贴 30 天

bt=ebt\*ones(1,lbt); cbt=cumsum(bt);%累计补贴b0=1.645;

baifenbi=@(butie)exp(b0-11.532./butie);%S curve cper=baifenbi(cbt)/100;%预测订单数t0=dataall(time-1).taxi;

r=size(t0,1); matchn=[];

matchna=match(time).matchpstats;%8 点的难易度

for i=1:lbt

p0=op;

p0(:,3)=p0(:,3).\*(1-cper(i));

disp=zeros(lp0,lc0); for j=1:lp0

p00=ones(r,1)\*p0(j,1:2); d=dis(p00(:,1),p00(:,2),t0(:,1),t0(:,2));

for k=1:lc0

ts=sum(t0(d<=C0(k),3)); if ts<p0(j,3)

disp(j,k)=1; elseif ts>p0(j,3)

disp(j,k)=-1;

end

end

else

end

disp(j,k)=0;

end

idx=ones(lp0,1)\*(1:lc0); idx(disp>0)=inf; idxsel=min(idx,[],2); idxsel(isinf(idxsel))=C0(end); matchn(i).loc=p0(:,1:2); matchn(i).matchp=disp; matchn(i).matchpstats=idxsel; matchna=[matchna,idxsel];

## %问题(3)方案 2 time=8;

op=dataall(time).passenger;%选择 8 点的乘客数据[count,center]=hist(op(:,3)); count=count./sum(count);

set(gcf,'PaperType','A4', ... 'paperOrientation', 'portrait', ...

'paperunits','CENTIMETERS','PaperPosition',[.00, .00,10,8]); hist(op(:,3))

ylabel('频数')

xlabel('乘客需求')

title('成都市 8 点乘客需求条图') figname=strcat('chengdu8bar','.jpg'); saveas(gcf, figname, 'jpg');

%密集点datat=dataall(8).taxi; datap=dataall(8).passenger; set(gcf,'PaperType','A4', ...

'paperOrientation', 'portrait', ... 'paperunits','CENTIMETERS','PaperPosition',[.00, .00,10,8]);

geoshow(chengdu); % 此处用 mapshow 投影会不正确

title('8 点成都乘客打车需求最大区') hold on

scatter(datat(:,1),datat(:,2),datat(:,3),'filled','o','g') [~,idx]=max(datap(:,3)); scatter(datap(idx,1),datap(idx,2),datap(idx,3),'filled','s','r') legend('出租车','乘客','Location','Best')

xlabel('经度')

ylabel('纬度')

for kk=1:length(chengdu)

text(mean(chengdu(kk).BoundingBox(:,1)),mean(chengdu(kk).BoundingBox(:,2)),name(kk)); end

hold off figname=strcat('chengdu8miji','.jpg'); saveas(gcf, figname, 'jpg');

% 方 案 2 datat=dataall(8).taxi; datap=dataall(8).passenger; sumt=sum(datat(:,3)); datat(:,3)=datat(:,3)\*0.99;

datat(end+1,1:2)=datap(idx,1:2); datat(end,3)=sumt-sum(datat(:,3)); p0=datap;

t0=datat; r=size(t0,1); disp=zeros(lp0,lc0); matchn=[];

matchna=match(time).matchpstats;%8 点的难易度

for j=1:lp0

p00=ones(r,1)\*p0(j,1:2); d=dis(p00(:,1),p00(:,2),t0(:,1),t0(:,2));

for k=1:lc0

ts=sum(t0(d<=C0(k),3)); if ts<p0(j,3)

disp(j,k)=1; elseif ts>p0(j,3)

disp(j,k)=-1;

end

end

else

end

disp(j,k)=0;

idxs=ones(lp0,1)\*(1:lc0); idxs(disp>0)=inf;

idxsel=min(idxs,[],2); idxsel(isinf(idxsel))=C0(end); matchn.loc=p0(:,1:2); matchn.matchp=disp; matchn.matchpstats=idxsel; matchna=[matchna,idxsel]; set(gcf,'PaperType','A4', ...

'paperOrientation', 'portrait', ... 'paperunits','CENTIMETERS','PaperPosition',[.00, .00,12,8]);

plot(1:40,matchna(1:40,1),'ro',1:40,matchna(1:40,2),'b+') title('方案 2 的应用前后对比')

xlabel('数据点')

ylabel('难易度') grid on

figname=strcat('chengdu8mijiduibi','.jpg'); saveas(