

clear
clc

% Programa para gera??o da funcao covariancia empirica-----
% Desenvolvido por Rogers uppedkestrel464
% C?lculo com Base na teoria de Pedro Correia (2010) - Uma intr. a Geoestat.
% [X Y Qtde]

coord=[

-56.325975370789 -28.627523288835 12.712179124412
-55.52993237722 -28.627523288835 10.671903563696
-54.335867886866 -28.248455196659 9.1237783277485
-53.48296467947 -28.665430098053 9.5521495165089
-52.554247853639 -28.589616479618 8.8142116401181
-51.246462935633 -28.210548387442 7.5268147740682
-50.317746109802 -28.589616479618 6.782818043309
-50.355652919019 -29.252985640925 6.2753600575881
-49.635423543885 -29.442519687013 2.5692232989279
-50.279839300584 -30.257516085191 4.0365271123144
-51.28436974485 -30.352283108235 6.3418965622119
-51.43599698172 -29.518333305448 5.8002888817168
-52.85750232738 -29.480426496231 9.1421299112185
-52.667968281292 -30.219609275974 9.1139808576188
-53.63459191634 -30.371236512844 11.526086956383
-53.464011274861 -29.556240114666 9.7834513284233
-54.639122360606 -30.390189917453 12.610673124521
-54.677029169824 -29.556240114666 10.916002340584
-54.222147459213 -29.252985640925 10.614168112981
-55.264584712696 -29.594146923884 11.556568123082
-55.776326637134 -30.42809672667 13.845857381697
-55.321444926523 -30.390189917453 13.26516032616
-55.510978972611 -31.318906743284 15.004547489569
-56.62922984453 -30.333329703626 14.527822135498
-54.43063490991 -31.584254407807 14.085798463882
-53.426104465644 -31.37576695711 12.960302296241
-52.611108067466 -31.697974835459 10.407693665635
-52.307853593725 -31.280999934066 9.8468589454287
-51.473903790938 -31.280999934066 7.6399823930719
-51.265416340241 -31.622161217024 6.7153105153888
-50.412513132846 -31.622161217024 6.4149840777428

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-50.545186965107 -30.712397795802 5.212112479719
-51.473903790938 -32.607738256682 7.4558115311981
-51.75820486007 -32.247623569114 7.9256030782469
-52.156226356855 -32.778318898161 9.0004902980036
-52.649014876683 -32.494017829029 10.372487201709
-53.369244251817 -32.494017829029 12.117988190576
-54.373774696083 -32.47506442442 14.177031810096
-54.563308742171 -31.641114621633 14.30042389149
-53.255523824164 -28.229501792051 9.0332228445282
-51.852971883114 -29.821587779189 6.2409114588693
-54.557936547444 -32.353260584166 14.3611245308
-55.323308926255 -32.353260584166 15.494619812088
-55.251103984858 -31.746739076429 15.266345334068
-53.705918238957 -30.779192861706 12.650564336148
-52.247378422733 -30.67810594375 9.2518602527415
-55.323308926255 -30.605901002353 13.710972296283
-56.420824035493 -31.270186463208 15.604682965208
-54.312439746694 -31.385714369443 13.896438304149
-56.50746996517 -32.353260584166 16.666137080179
-56.666320836244 -32.714285291152 16.964168647913
-55.568805727006 -33.263042845771 15.955691780092
-54.745669395077 -33.436334705125 14.930065841339
-54.485731606047 -32.613198373196 14.555703332327
-50.48557785264 -27.81879026442 6.4971975424876

```

```
];
```

```
%Testes Anisotropia - 1
```

```
%coord(:,1)=coord(:,1)*10
```

```
%Separacao das componentes para calculo da distancia-----
```

```
X=coord(:,1);
```

```
Y=coord(:,2);
```

```
mag=coord(:,3);
```

```
%Tamanho da amostra-----
```

```
tam=size(coord);
```

```
tam=tam(1,1);
```

```
%Distancia entre todos os pontos-----
```

```
%listaespec gera lista com | d |(h(1)-h(2))^2 | X1 | Y1 | X2 | Y2 |
```

```

espacamento=0;
contador=1;

tic
listespac=zeros(tam*tam,4);
for j=1:(tam)
    for i=j+1:(tam) % nao pode ir ate o final da amostra-----
        espac=((coord(j,1)-coord(i,1))^2+(coord(j,2)-coord(i,2))^2)^0.5;
        %-----
        % Var Experimental
        var=(coord(j,3)-coord(i,3))^2;
        % Vagner Cov
        covemp=(coord(j,3)*coord(i,3));
        %-----
        listaespac(contador,1)=espac;
        listaespac(contador,2)=var;
        listaespac(contador,3)=covemp;
        % listaespac(contador,3)=coord(j,1);
        % listaespac(contador,4)=coord(j,2);
        % listaespac(contador,5)=coord(i,1);
        % listaespac(contador,6)=coord(i,2);
        contador=contador+1;
    % i
    % j
    end
end
format bank;

% Ordenando as distancias, da menor para a maior-----
B=sortrows(listaespac,1);

% Definindo h-----
h1=0.5 % espa?amento cont?nuo a ser incrementado
h=h1 % espa?amento atualizado a cada separa??o de classes
% Classificacao das distancias, usando operadores logicos-----
intinf=min(listaespac(:,1)); % intervalo inferior dist?ncia
intsup=max(listaespac(:,1)); % intervalo superior dist?ncia
k=1 % contador

% Fun??o Gama Isotr?pica-----
intinf=0;
for dist=intinf:h1:intsup

```

```

Dist=(B(:,1)).*(and ( (B(:,1)>intinf), (B(:,1)<=h) ) );
Cov=Dist;
Covvalor=(B(:,2)).*(and ( (B(:,1)>intinf), (B(:,1)<=h) ) );
Cov(:,2)=Covvalor;
covempvalorfin=(B(:,3)).*(and ( (B(:,1)>intinf), (B(:,1)<=h) ) );
GAMA(k,1)=sum(Covvalor)/(2*nnz(Dist));
GAMA(k,2)=h;
GAMA(k,3)=nnz(Covvalor);
GAMA(k,4)=sum(covempvalorfin)-(mean(covempvalorfin))^2;
intinf=h;
h=h+h1;
k=k+1;

```

```

end
%GAMA cont?m |COVARI?NCIA| DIST CORRELA??O

```

```

toc

```

```

subplot(2,1,1)
plot(GAMA(:,2),GAMA(:,1),'-mo');
legend('Variograma');grid on
ylabel('m^2')
xlabel('^circ')
subplot(2,1,2)
plot(GAMA(:,2),GAMA(:,4),'-*');
legend('Cov. empirica');grid on
ylabel('m^2')
xlabel('^circ')
magmedia=mean(mag);
af1=mag-magmedia;
af2=(5+af1)*50
%figure
%%scatter(X,Y,af2);grid on;

```

```

% GAMA % h % num.produtos

```

```

GAMA;

```

```

%Testes Anisotropia 2

```

```

%Fun??o Gama Anisotr?pica-----

```

```

%coord2=sortrows(coord,2);

```

```

%dist2=sqrt( (bsxfun(@minus,X,X').^2)+(bsxfun(@minus,Y,Y').^2));

```

```
%matdist=triu(dist2)
%matdist2=nonzeros(matdist)
```