

ΤΕΧΝΙΚΕΣ ΒΕΛΤΙΣΤΟΠΟΙΗΣΗΣ

3η Εργαστηριακή Άσκηση

Μέθοδος μέγιστης καθόδου με προβολή

Matlab source

ΚΩΝΣΤΑΝΤΙΝΟΣ ΚΩΣΤΑΣ

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ΘΕΜΑ 1

//////////////////////////////////////////////////////////////////

syms x y g

f1=@(x,y) (1/2\*x^2+1/2\*y^2);

dfdx=diff(f1,x);

dfdy=diff(f1,y);

efinish=0.01;

X=1:100;

Y=1:100;

X(1)=8;

Y(1)=3;

k=1;

plot(X(1),Y(1),'o');

hold on

while sqrt((subs(dfdx,[x,y],[X(k),Y(k)]))^2+(subs(dfdy,[x,y],[X(k),Y(k)])^2))>= efinish

A=-subs(dfdx,[x,y],[X(k),Y(k)]);

B=-subs(dfdy,[x,y],[X(k),Y(k)]);

dx=@(g) X(k)+g\*A;

dy=@(g) Y(k)+g\*B;

%f2=@(g) f1(dx(g),dy(g));

%dmin=fminsearch(f2,0);

dmin=0.1;

k=k+1;

X(k)=dx(dmin);

Y(k)=dy(dmin);

plot(X(k),Y(k),'o');

hold on

end

///////////////////////////////////////////////////////////////////

ΘΕΜΑ 2

///////////////////////////////////////////////////////////////////

syms x y g

f1=@(x,y) (1/2\*x^2+1/2\*y^2);

dfdx=diff(f1,x);

dfdy=diff(f1,y);

efinish=0.01;

X=1:100;

Y=1:100;

X(1)=8;

Y(1)=3;

k=1;

plot(X(k),Y(k),'o');

hold on

if X(1)>10

X(1)=10;

end

if X(1)<-20

X(1)=-20;

end

if Y(1)>15

Y(1)=15;

end

if Y(1)<-12

Y(1)=-12;

end

plot(X(1),Y(1),'o');

hold on

while sqrt((subs(dfdx,[x,y],[X(k),Y(k)]))^2+(subs(dfdy,[x,y],[X(k),Y(k)])^2))>= efinish

A=-subs(dfdx,[x,y],[X(k),Y(k)]);

B=-subs(dfdy,[x,y],[X(k),Y(k)]);

dx=@(g) X(k)+g\*A;

dy=@(g) Y(k)+g\*B;

gk=0.1;

sk=15;

R(k)=dx(sk);

if R(k)>10

R(k)=10;

end

if R(k)<-20

R(k)=-20;

end

L(k)=dy(sk);

if L(k)>15

L(k)=15;

end

if L(k)<-12

L(k)=-12;

end

X(k+1)=X(k)+gk\*(R(k)-X(k));

Y(k+1)=Y(k)+gk\*(L(k)-Y(k));

plot(X(k),Y(k),'o');

k=k+1;

hold on

end

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ΘΕΜΑ 3

///////////////////////////////////////////////////////////////////

syms x y g

f1=@(x,y) (1/2\*x^2+1/2\*y^2);

dfdx=diff(f1,x);

dfdy=diff(f1,y);

efinish=0.02;

X=1:100;

Y=1:100;

X(1)=-5;

Y(1)=7;

k=1;

plot(X(k),Y(k),'o');

hold on

if X(1)>10

X(1)=10;

end

if X(1)<-20

X(1)=-20;

end

if Y(1)>15

Y(1)=15;

end

if Y(1)<-12

Y(1)=-12;

end

plot(X(1),Y(1),'o');

hold on

while sqrt((subs(dfdx,[x,y],[X(k),Y(k)]))^2+(subs(dfdy,[x,y],[X(k),Y(k)])^2))>= efinish

A=-subs(dfdx,[x,y],[X(k),Y(k)]);

B=-subs(dfdy,[x,y],[X(k),Y(k)]);

dx=@(g) X(k)+g\*A;

dy=@(g) Y(k)+g\*B;

gk=0.3;

sk=20;

R(k)=dx(sk);

if R(k)>10

R(k)=10;

end

if R(k)<-20

R(k)=-20;

end

L(k)=dy(sk);

if L(k)>15

L(k)=15;

end

if L(k)<-12

L(k)=-12;

end

X(k+1)=X(k)+gk\*(R(k)-X(k));

Y(k+1)=Y(k)+gk\*(L(k)-Y(k));

plot(X(k),Y(k),'o');

k=k+1;

hold on

end

///////////////////////////////////////////////////////////////////

ΘΕΜΑ 4

///////////////////////////////////////////////////////////////////

syms x y g

f1=@(x,y) (1/2\*x^2+1/2\*y^2);

dfdx=diff(f1,x);

dfdy=diff(f1,y);

efinish=0.01;

X=1:100;

Y=1:100;

X(1)=11;

Y(1)=3;

k=1;

plot(X(k),Y(k),'o');

hold on

if X(1)>10

X(1)=10;

end

if X(1)<-20

X(1)=-20;

end

if Y(1)>15

Y(1)=15;

end

if Y(1)<-12

Y(1)=-12;

end

plot(X(1),Y(1),'o');

hold on

while sqrt((subs(dfdx,[x,y],[X(k),Y(k)]))^2+(subs(dfdy,[x,y],[X(k),Y(k)])^2))>= efinish

A=-subs(dfdx,[x,y],[X(k),Y(k)]);

B=-subs(dfdy,[x,y],[X(k),Y(k)]);

dx=@(g) X(k)+g\*A;

dy=@(g) Y(k)+g\*B;

gk=0.01;

sk=0.1;

R(k)=dx(sk);

if R(k)>10

R(k)=10;

end

if R(k)<-20

R(k)=-20;

end

L(k)=dy(sk);

if L(k)>15

L(k)=15;

end

if L(k)<-12

L(k)=-12;

end

X(k+1)=X(k)+gk\*(R(k)-X(k));

Y(k+1)=Y(k)+gk\*(L(k)-Y(k));

plot(X(k),Y(k),'o');

k=k+1;

hold on

end