ASSIGNMENT 4

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Q: Find the extreme values of the function $f(x, y) = 3x + 4y$ on the circle $x^2 + y^2 = 1$ by using lagrange's multiplier method

Assignment3.m

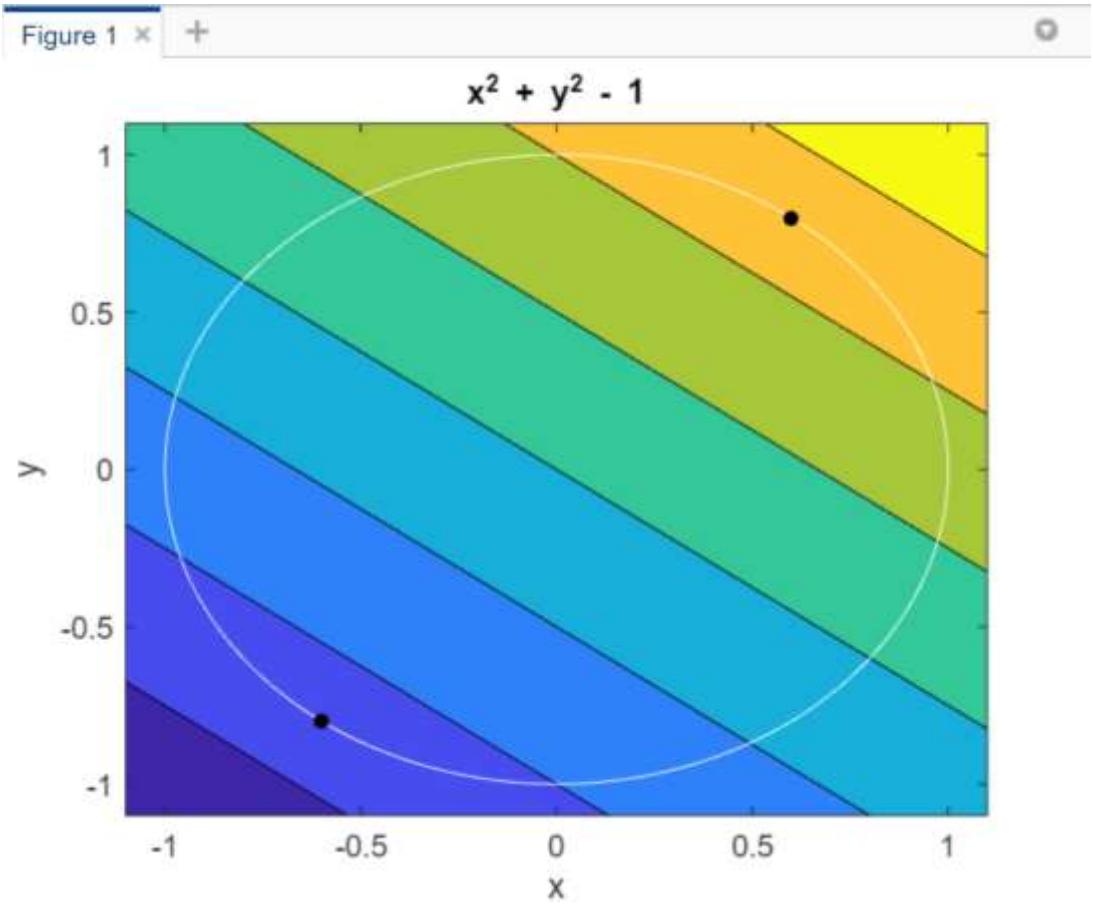
```
clc
clear all
format compact
syms x y lam real
f= 3*x + 4*y;
g= x^2 + y^2 - 1;

F=f-lam*g;
Fd=jacobian(F,[x y lam]);
[ax,ay,alam]=solve(Fd,x,y,lam);
ax=double(ax); ay=double(ay);
T = subs(f,{x,y},{ax,ay}); T=double(T);
epxl=min(ax);
epxr=max(ax);
epyl=min(ax);
epyu=max(ax)
D=[epxl-0.5 epxr+0.5 epyl-0.5 epyu+0.5]

ezcontourf(f,D)
hold on
h = ezplot(g,D);
set(h,'Color',[1,1,1])

for i = 1:length(T);
fprintf('The critical point (x,y) is (%1.3f,%1.3f).',ax(i),ay(i))
fprintf('The value of the function is %1.3f\n',T(i))
plot(ax(i),ay(i),'k.','markersize',15)
end

TT=sort(T);
f_min=TT(1);
f_max=TT(end);
```



Command Window

```
epyu =
    0.6000
D =
   -1.1000    1.1000   -1.1000    1.1000
The critical point (x,y) is (-0.600,-0.800).The value of the function is -5.000
The critical point (x,y) is (0.600,0.800).The value of the function is 5.000
>>
```