**MAXIMA AND MINIMA**

**clc  
clear all  
syms x y real  
f=input('Enter the function in terms of x and y ')  
fx=diff(f,x)  
fy=diff(f,y)  
[ax ay]=solve(fx,fy)  
fxx=diff(fx,x)  
fyy=diff(fy,y)  
fxy=diff(fx,y)  
D=fxx\*fyy-(fxy^2)  
ezsurf(f)  
colormap(cool)  
hold on  
for i=1:1:size(ax)  
   a=subs(subs(D,x,ax(i)),y,ay(i))  
   b=subs(subs(fxx,x,ax(i)),y,ay(i))  
   c=subs(subs(f,x,ax(i)),y,ay(i))  
   display(a)  
   if(a>0 && b>0)  
         sprintf('The point (%d,%d) is minima point',double(ax(i)),double(ay(i)))  
         sprintf('The function value is %d',double(c))  
   else if(a>0 && b<0)  
             sprintf('The point (%d,%d) is maxima point',double(ax(i)),double(ay(i)))  
             sprintf('The function value is %d',double(c))  
       else if(a<0)  
               sprintf('The point (%d,%d) is saddle point',double(ax(i)),double(ay(i)))  
               sprintf('The function value is %d',double(c))  
           else  
                   sprintf('Nothing can be concluded at (%d,%d)',double(ax(i)),double(ay(i)))  
           end  
       end  
   end  
end  
plot(double(ax(1)),double(ay(1)),'r:\*','markersize',25)  
% plot(double(ax(2)),double(ay(2)),'r:\*','markersize',25)  
% plot(double(ax(3)),double(ay(3)),'r:\*','markersize',25)**