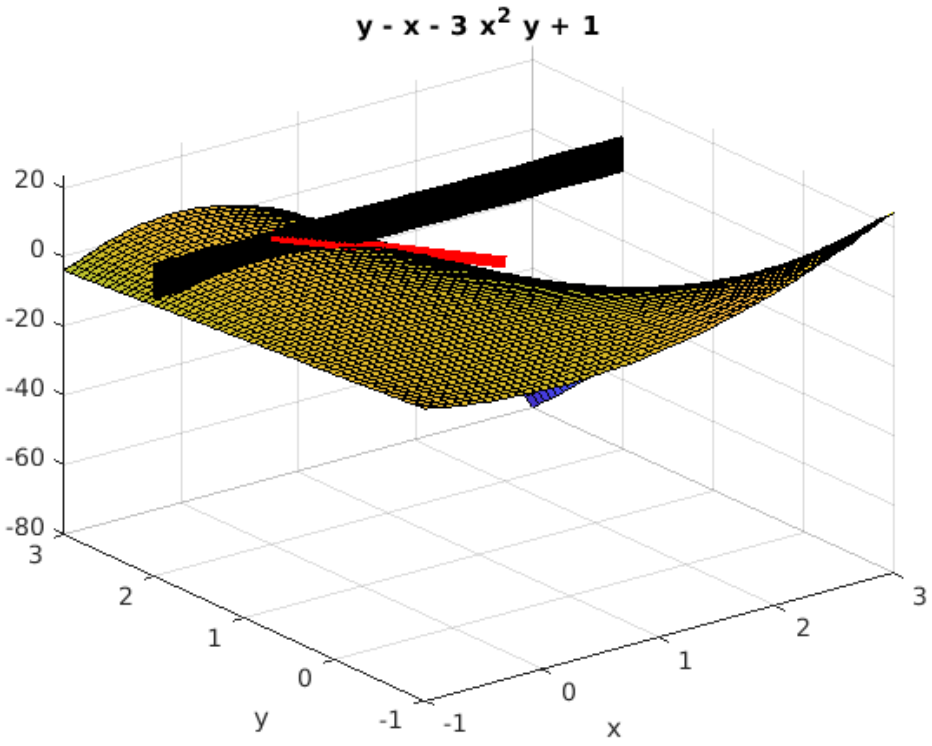
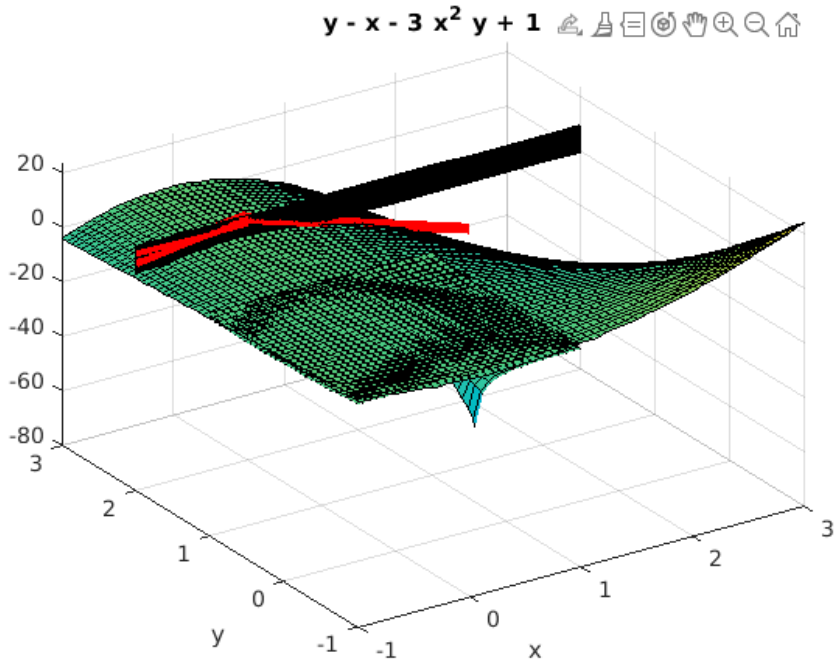
```
% Calculating Partial Derivative

clc
clear all
syms x y


z = input('Enter the two dimensional function f(x,y): ');
x1 = input('enter the x value at which the derivative has to be
evaluated: ');
y1 = input('enter the y value at which the derivative has to be
evaluated: ');
z1 = subs(subs(z,x,x1),y,y1)
ezsurf(z,[x1-2 x1+2])
f1 = diff(z,x)    %Partial derivative w.r.to 'x'
slopex = subs(subs(f1,x,x1),y,y1);

%Plane along y-axis
[x2,z2]=meshgrid(x1-2:0.25:x1+2,0:0.5:10);
y2=y1*ones(size(x2));
hold on
surf(x2,y2,z2);

%Tangent to the curve 'C', which is created by the crossing of the
Plane along y-axis
t=linspace(-1,1);
x3=x1+t;
y3=y1*ones(size(t));
z3=z1+slopex*t;
line(x3,y3,z3,'color','red','linewidth',5)
```

OUTPUT WINDOW:

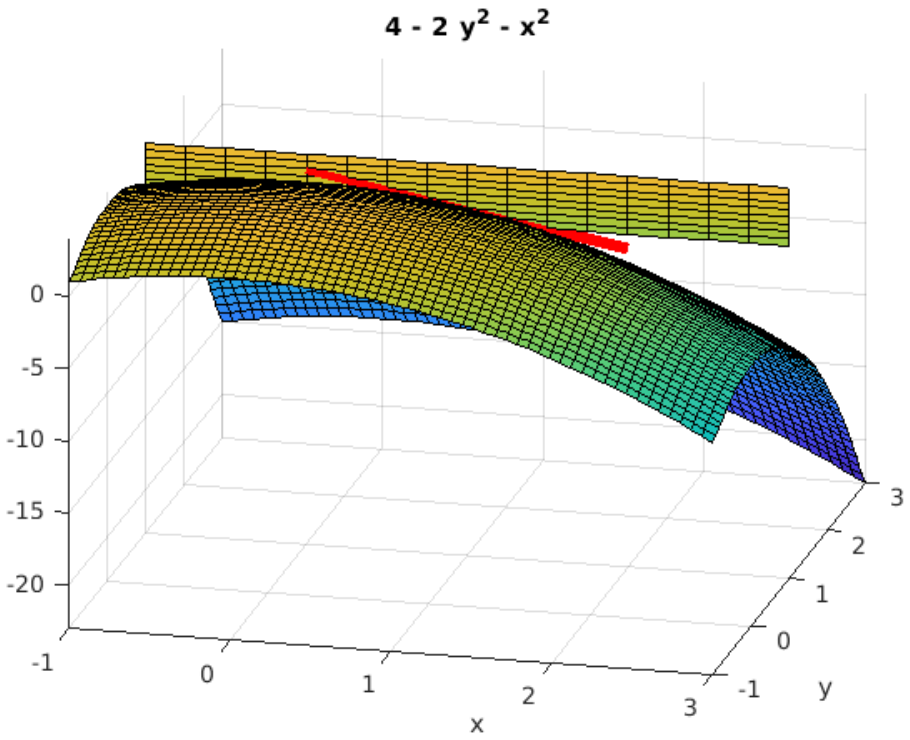
```
Enter the two dimensional function f(x,y):
x*y + 2*y^2 - x^y
enter the x value at which the derivative has to be evaluated:
-1
enter the y value at which the derivative has to be evaluated:
2

z1 =

5


f1 =

y - x^(y - 1)*y
```



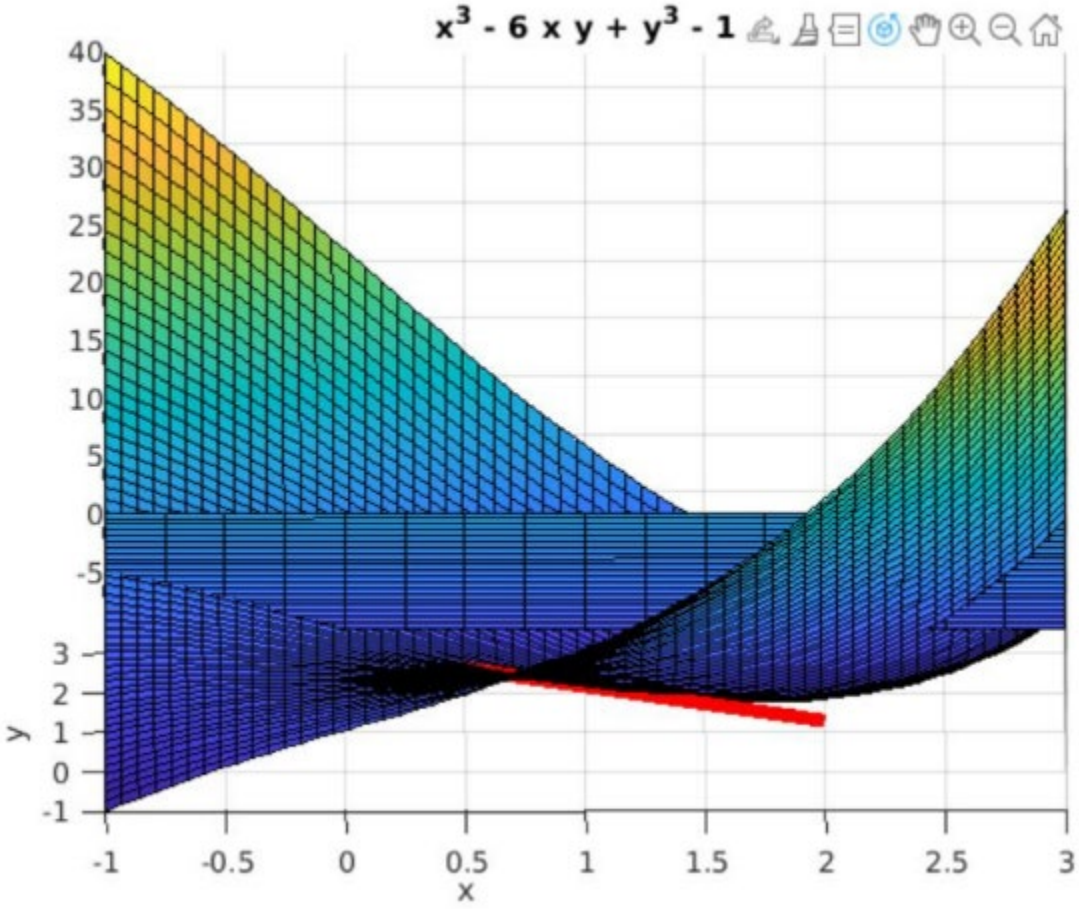
```
Enter the two dimensional function f(x,y):
1-x+y-3*(x^2)*y
enter the x value at which the derivative has to be evaluated:
1
enter the y value at which the derivative has to be evaluated:
2

z1 =

-4


f1 =

- 6*x*y - 1
```



```
Enter the two dimensional function f(x,y):
4-x^2-2*(y^2)
enter the x value at which the derivative has to be evaluated:
1
enter the y value at which the derivative has to be evaluated:
1

z1 =

1


f1 =

-2*x
```



```
Enter the two dimensional function f(x,y):

x^3 + y^3 - 6*x*y - 1
enter the x value at which the derivative has to be evaluated:
1
enter the y value at which the derivative has to be evaluated:
1


z1 =


-5



f1 =


3*x^2 - 6*y
```



```
Enter the two dimensional function f(x,y):
sin(x/(1+y))
enter the x value at which the derivative has to be evaluated:
1
enter the y value at which the derivative has to be evaluated:
2

z1 =

sin(1/3)


f1 =

cos(x/(y + 1))/(y + 1)
```