**VECTOR FIELD GRADIENT  
Aim:  
1. To write Matlab codes to visulaize the vector field of 2-Dimensions as well as 3-Dimensions.  
2. To find the gradient vector and visulaize it with contour curves.   
  
2-D  
clc   
clear all  
syms x y  
F=input('Enter the vector as i,j in vector form')  
P=inline(vectorize(F(1)),'x','y');  
Q=inline(vectorize(F(2)),'x','y');  
x=linspace(0,1,10),y=x;  
[X,Y]=meshgrid(x,y);  
U=P(X,Y)  
V=Q(X,Y)  
quiver(X,Y,U,V,1)  
axis on  
xlabel('x')  
ylabel('y')  
  
3-D  
clc  
clear all  
syms x y z  
F=input('Enter the vector as i,j,k in vector form')  
P=inline(vectorize(F(1)),'x','y','z');  
Q=inline(vectorize(F(2)),'x','y','z');  
R=inline(vectorize(F(3)),'x','y','z');  
x=linspace(0,1,10),y=x,z=x;  
[X,Y,Z]=meshgrid(x,y,z);  
U=P(X,Y,Z)  
V=Q(X,Y,Z)  
W=R(X,Y,Z)  
quiver3(X,Y,Z,U,V,W,1)  
axis on  
xlabel('x')  
ylabel('y')  
zlabel('z')**

**Gradient and Visualization  
clc   
clear all  
syms x y   
f=input('Enter the vector as i,j in vector form')  
f1=diff(f,x)  
f2=diff(f,y)  
P=inline(vectorize(f1),'x','y');  
Q=inline(vectorize(f2),'x','y');  
x=linspace(0,1,10)  
y=x;  
[X,Y]=meshgrid(x,y);  
U=P(X,Y)  
V=Q(X,Y)  
quiver(X,Y,U,V,1)  
axis on  
xlabel('x')  
ylabel('y')  
hold on  
ezcontour(f,[0,1])**