Vector Patch

```
>>
>> t = (0:1:100);
>>
>> F = sin(t).^2;
>>
>> figure(1);
>> plot(t(1:50),F(1:50));
>>
>> whos
  Name      Size                    Bytes  Class

  F         1x101                     808  double array
  t         1x101                     808  double array

Grand total is 202 elements using 1616 bytes

>>
```

Tensor Patches

```
>>
>> A = ones(100,100);
>> B = A(3,:);
>> C = A(:,21);
>> whos
  Name      Size                    Bytes  Class

  A       100x100                   80000  double array
  B         1x100                     800  double array
  C       100x1                       800  double array
  F         1x101                     808  double array
  t         1x101                     808  double array

Grand total is 10402 elements using 83216 bytes

>>
```

Check

sum
diff
rand

Tensor Length

```
>>
>> A = ones(10,20);
>> N1 =length(A(1,:));
>> N2 = length(A(:,1));
>>
>> N1

N1 =

    20

>> N2

N2 =

    10

>> whos
  Name      Size                    Bytes  Class

  A        10x20                     1600  double array
  N1        1x1                        8  double array
  N2        1x1                        8  double array

Grand total is 202 elements using 1616 bytes

>>
```

To do

1) t = (0:0.1:10)
2) F = exp(sin (t^2))
3) G = tan(sin (t^2))
4) Plot F(t) : t=(0-5)
5) Plot G(t) : t=(0-7)
6) H(t) = Integral F(t), t_min=0, t_max = t;
7) Plot H(t) : t=(0-10)
8) H1(t) = H(t)cos(t) + 0.01*(random number [0-1])
9) H2(t) = d/dt H1(t)
10) Plot on single graph:
    F(t) : t=0-10 (blue)
    H(t) : t=0-10 (red)
    H2(t) : t=0-10 (green)

Gradient

$$\nabla F = \frac{\partial F}{\partial x}\hat{i} + \frac{\partial F}{\partial y}\hat{j}$$

$$\nabla F = \frac{\partial F}{\partial x}\hat{i} + \frac{\partial F}{\partial y}\hat{j} + \frac{\partial F}{\partial z}\hat{k} + \ldots$$

```
FX = gradient(F)
[FX,FY] = gradient(F)
[FX,FY,FZ,...] = gradient(F)
```

Check:

gradient
contour
quiver

To do:

Calculate gradient: F(x,y) = x*exp(-x^2+y^2);
Contour plot;
Quiver plot;