

## LOOPS WITH VECTORS

For example, let's say that we want to multiply every element of a vector  $\mathbf{v}$  by 3, and store the result back in  $\mathbf{v}$ , where  $\mathbf{v}$  is initialized as follows:

```
>> v = [3 7 2 1];
```

We can loop through all of the elements in the vector and multiply each element by 3.

```
for i = 1:length(v)    or    for i = 1 : 4
```

```
    v(i) = v(i) * 3;
```

```
end
```

EX: If  $\mathbf{x}$  is a row or column vector, Assuming that  $\mathbf{x}$  is a column vector of length  $m$  and  $\mathbf{k}$  is a row vector containing the integers from 1 to  $n$ , for each of the following, write MATLAB code employing for loops to evaluate the expression:

$$1) \sum_{i=1}^m \frac{1}{x_i} \qquad 2) \sum_{k=1}^n \frac{1}{1+k} \qquad 3) \sum_{i=1}^m \frac{x_i}{1+\sin x_i} \qquad 4) \sum_{i=1}^m x_i e^{-x_i^2}$$

**EX: 1/ Define the variables ,x=0.85 , y=12.5 and then use them to create a column vector that has the following elements : y,  $y^x$ ,  $\ln(y/x)$ , y.x and x+y**

```
x=0.85; y=12.5;  
v=[y; y^x; log(y/x); y*x; x+y]  
>>v =  
    12.5000  
     8.5580  
     2.6882  
    10.6250  
    13.3500
```

**EX: 2 / Create a column vector in which the first element is 22.5, the elements decrease with increments of  $-2.5$ , and the last element is 0.**

```
v=[22.5: -2.5: 0]'  
>> v =  
    22.5000  
    20.0000  
    17.5000  
    15.0000  
    12.5000  
    10.0000  
     7.5000  
     5.0000  
     2.5000  
     0
```