++++++++++++++++++ Lab 002 ++++++++++++++++++

++++++++++++++++++ 2154638 ++++++++++++++++++

CSCM70

CODE:

1)

```
% CSCM 70 ----------- LAB 02 -----------
% CSCM 70 ----------- 2154638 -----------
% ====================================================================

% CSCM 70 ----------- LAB 02 -----------
% CSCM 70 ----------- 2154638 -----------
% ====================================================================

% Exercise 1 ----->-> FOR LOOPS Task 2 <-<----- ##START##
% calculate the L2 norm of  v = [ 3; 2; -1; -2] using for loop
% Call this -> w = [ 2; 9; -4; -6; 7; 0; 1]
% in Command Window write : call2norm([ 3; 2; -1; -2])
% in Command Window write : call2norm([ 2; 9; -4; -6; 7; 0; 1])

function res=call2norm(p) % Fxn created
k=0;                      % variable initiated
x=length(p);              % till length of p
for i=1:x                 % starting from 1 till length of p can be said x
    k = k + p(i)^2;       % Taking the initated variable and appending it with a
sqare of p

end
res=sqrt(k);              % at the end sqrt of l2 norm as taught in class
end
% Exercise 1 ----->-> FOR LOOPS Task 2 <-<----- ##END##
```

```
% ------------------------------------------------------------
```

2.)

```
% CSCM 70 ----------- LAB 02 -----------
% CSCM 70 ----------- 2154638 -----------
% ====================================================================

% Exercise 1 ----->-> FOR LOOPS Task 1<-<----- ##START##
% calculate the L2 norm of  v = [ 3; 2; -1; -2] using for loop
% Call this -> w = [ 2; 9; -4; -6; 7; 0; 1]
% in Command Window : You are getting output as a result of v,p & norm of v

v = [ 3; 2; -1; -2]       % given the value as said in quest
p = v                     % assigned the value to another variable so it can be
used again
k=0;                      % variable initiated
x=length(p);              % till length of p
for i=1:x                 % starting from 1 till length of p can be said x
```

```
    k = k + p(i)^2;       % Taking the initated variable and appending it with a
sqare of p

end
res=sqrt(k)               % at the end sqrt of l2 norm as taught in class
% Exercise 1 ----->-> FOR LOOPS Task 1<-<----- ##END##
```

3.)

```
% CSCM 70 ----------- LAB 02 -----------
% CSCM 70 ----------- 2154638 -----------
% ====================================================================

% Exercise 2 ----->-> Linear Dependence <-<----- ##START##
% calculate (A + H)x = v ; h=1 ;
% devide h/2 with each itteration of the loop
% 10 iterations
% Also calculate each solution vector x using mynorm.
% % in Command Window : You are getting output
% % in Command Window :
disp('----------------------Question Start----------------------');
A = [1 1 3; 1 0 2; 0 1 1];    % Given value
v = [2;2;6];                  % Given value
h = 1;                        % Given value
H = [0 0 h; 0 0 0; 0 0 0];    % Given value

                              % written to try x = A \ v
W = A\v
disp('Displaying W in an officaila way');
disp(W)
empty = [];                   % empty vector declared
disp('this is the empty set below');
disp(empty)
                              % Makinf a for loop
for j = 1:10                  % Doing it for 10 itteration given
    R = A + H;
    disp('this is R displayed below');
    disp(R)
    S = R \ v;
    disp('this is S displayed below');
    disp(S)
    fprintf("Norm of the solution vector(S) %d = %f \n", j ,call2norm(S))
    T = S';
    H(1,3) = H(1,3)/2;        % Going to 1 row 3rd column and deviding it by 2 on
each iteration
    empty(j) = call2norm(T);
    fprintf("Norm of the solution vector(T) %d = %f \n", j ,call2norm(T))
end
disp(empty)
disp('----------------------Question End----------------------');

% Exercise 2 ----->-> Linear Dependence <-<----- ##END##



% ============================================================
```

OUTPUT : COMMAND WINDOW

1.)

```
>> diary '04_call2norm_01.txt'
>> diary on
>> call2norm([ 3; 2; -1; -2])

ans =

    4.2426

>> call2norm([ 2; 9; -4; -6; 7; 0; 1])

ans =

   13.6748

>> diary off
>>
```

2.)

```
Command Window
>> diary '05_call2norm_task1_02.txt'
>> diary on

v =

     3
     2
    -1
    -2


p =

     3
     2
    -1
    -2


res =

    4.2426

>> diary off
fx >>
```

3.)

diary on

----------Question Start----------

[Warning: Matrix is singular to working precision.]

W =

NaN

-Inf

Inf

Displaying W in an officaila way

NaN

-Inf

Inf

this is the empty set below

this is R displayed below

1 1 4

1 0 2

0 1 1

this is S displayed below

14

12

-6

Norm of the solution vector(S) 1 = 19.390719

Norm of the solution vector(T) 1 = 19.390719

this is R displayed below

1.0000 1.0000 3.5000

1.0000 0 2.0000

0 1.0000 1.0000

this is S displayed below

26

18

-12

Norm of the solution vector(S) 2 = 33.823069

Norm of the solution vector(T) 2 = 33.823069

this is R displayed below

1.0000 1.0000 3.2500

```
   1.0000         0    2.0000
        0    1.0000    1.0000
```

this is S displayed below

```
   50
   30
  -24
```

Norm of the solution vector(S) 3 = 63.055531

Norm of the solution vector(T) 3 = 63.055531

this is R displayed below

```
   1.0000    1.0000    3.1250
   1.0000         0    2.0000
        0    1.0000    1.0000
```

this is S displayed below

```
   98
   54
  -48
```

Norm of the solution vector(S) 4 = 121.753850

Norm of the solution vector(T) 4 = 121.753850

this is R displayed below

```
   1.0000    1.0000    3.0625
   1.0000         0    2.0000
        0    1.0000    1.0000
```

this is S displayed below

```
  194
  102
  -96
```

Norm of the solution vector(S) 5 = 239.282260

Norm of the solution vector(T) 5 = 239.282260

this is R displayed below

1.0000	1.0000	3.0312
1.0000	0	2.0000
0	1.0000	1.0000

this is S displayed below

386

198

-192

Norm of the solution vector(S) 6 = 474.409106

Norm of the solution vector(T) 6 = 474.409106

this is R displayed below

1.0000	1.0000	3.0156
1.0000	0	2.0000
0	1.0000	1.0000

this is S displayed below

770

390

-384

Norm of the solution vector(S) 7 = 944.698894

Norm of the solution vector(T) 7 = 944.698894

this is R displayed below

1.0000	1.0000	3.0078
1.0000	0	2.0000
0	1.0000	1.0000

this is S displayed below

1538

774

-768

Norm of the solution vector(S) 8 = 1885.296794

Norm of the solution vector(T) 8 = 1885.296794

this is R displayed below

1.0000 1.0000 3.0039

1.0000 0 2.0000

0 1.0000 1.0000

this is S displayed below

3074

1542

-1536

Norm of the solution vector(S) 9 = 3766.501825

Norm of the solution vector(T) 9 = 3766.501825

this is R displayed below

1.0000 1.0000 3.0020

1.0000 0 2.0000

0 1.0000 1.0000

this is S displayed below

6146

3078

-3072

Norm of the solution vector(S) 10 = 7528.916522

Norm of the solution vector(T) 10 = 7528.916522

1.0e+03 *

0.0194 0.0338 0.0631 0.1218 0.2393 0.4744 0.9447 1.8853 3.7665 7.5289

----------Question End----------

diary off

WORKSPACE

++++++++++++++++++ Lab 002 END ++++++++++++++++++

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