SS LAB EXPERIMENT: 1

NAME: ADITYA PRATAP SINGH

ROLL NO. : 16EC01028

DATE: 01.08.2017

**Objective:**

To generate a square matrix and

1. Check if it is singular.
2. Calculate the determinant.
3. Find eigenvalues and eigenvectors.
4. Check the above mentioned tasks through inbuilt functions.

**MATLAB Code:**

n = input ('Enter a size of the matrix. \n');

fprintf('Enter the element of matrices. \n');

for i=1:n

for j=1:n

A(i,j)=input('');

end

end

det\_user = find\_det(A)

fprintf('Matching this determinant value through inbuilt function\n');

det\_function=det(A);

if(det\_function==0)

fprintf('The matrix is singular.\n');

else

fprintf('The matrix is not singular.\n');

end;

p=poly(A);

fprintf('The eigenvalues of the matrix\n');

r=roots(p)

fprintf('The eigenvectors are :\n');

[m,n]=size(A);

I=eye(n);

for t=r'

vec=null(A-t\*I)

end

fprintf('Checking the eigenvalues and eigenvectors by inbuilt function\n');

[v,e]=eig(A)

% User defined function for calculating determinant

function det\_user=find\_det(A)

[m,n]=size(A);

det\_user=0;

if(m==1)

det\_user=A;

else

for i=1:n

remain=[A(2:m,1:i-1) A(2:m,i+1:m)];

det\_user=A(1,i)\* find\_det (remain)\*(-1)^(i+1)+det\_user;

end;

end;

Result:

A = 2 4 3

1 5 4

2 3 1

det\_user = -7

Matching this determinant value through inbuilt function

det\_function = -7

The matrix is not singular.

The eigenvalues of the matrix

r = 8.4917

-1.1865

0.6948

The eigenvectors are :

vec = -0.6092

-0.6666

-0.4296

vec = -0.1371

-0.5221

0.8418

vec = 0.7466

-0.5376

0.3920

Checking the eigenvalues and eigenvectors by inbuilt function

v = -0.6092 -0.7466 -0.1371

-0.6666 0.5376 -0.5221

-0.4296 -0.3920 0.8418

e = 8.4917 0 0

0 0.6948 0

0 0 -1.1865

**Observation:**

I didn’t found any error to examine the matrices. The code was tested for several square matrices of various numbers of rows, i.e. 3x3, 4x4 etc. It properly worked for all cases. The result found in inbuilt function matched with the result gotten without inbuilt function.