Title: Compute eigenvalues and corresponding eigenvectors by Rayleigh power method.
In this experiment we find dominant (magnitude wise largest) Eigen value and corresponding Eigen vector of a square matrix using Rayleigh's power method
The method can also be applied to find the smallest eigenvalue by similar procedure using the inverse of the given matrix.

Ex1: Eigenvalues and corresponding Eigenvectors of a matrix.

Program:

```
clear
clc
A = [1,1,2;0,2,2;-1,1,3];
eig(A) % gives all the Eigen Values of the matrix A
[V D] = eig(A)    %here V=matrix whose columns are Eigen vector and
                  % D=diagonal matrix, diagonal elements are Eigen values.
```

Ex.2 Compute Largest Eigen value and corresponding eigenvectors by Rayleigh power method of a given matrix A= $[1,1,3;1,5,1;3,1,1]$

Program:

```
clear
clc
A = [1,1,3;1,5,1;3,1,1]; % Given matrix
X = [1;0;0]; % initial Eigen vector
n = 20; % number of iterations
for i=1: n
    X = A*X;
    M = max(abs(X));
    X=X/M;
end
fprintf ('The Dominant Eigen Value is %f\n',M)
disp ('The corresponding Eigen vector is ')
X
```

Ex.3 Compute Smallest Eigen value and corresponding eigenvectors by Rayleigh power method

Program:

```
clear
clc
A = [1,1,3;1,5,1;3,1,1]; % Given matrix
X = [1;0;0]; % initial Eigen vector
B=inv(A);
n = 20; % number of iterations
for i=1: n
    X = B*X;
    M = max(abs(X));
    X=X/M;
end
small = 1/M
fprintf('The smallest Eigen Value is %f\n', small)
disp ('The corresponding Eigen vector is ')
X
```