Problem 6


```
function eigen = eigcomp(A)
c=poly(A);
lambda = roots(c);
[n1,m1] =size(lambda);
lambda = round(roots(c)*10000)/10000;
fprintf('The eigenvalues are: \n');
disp(lambda);
lambda = unique(lambda);
lambda = unique(round(roots(c)*10000)/10000);
fprintf('To solve eigenvectors, we need the unique eigenvalues which are: \n');
disp(lambda
[n2,m2] =size(lambda);
for i=1:1:n2
disp(printf('\n Elgenvectors for eigenvale: \n lambda =%d\n',lambda(i)));
homsoln(A-lambda(i)*eye(sizeA),1)
end
%EIGEN Summary of this function goes here
%   Detailed explanation goes here
end
```

```
>> A = [7 -4 0;8 -5 0;-4 4 3]

A =

     7    -4     0
     8    -5     0
    -4     4     3

>> eigcomp(A)
The eigenvalues are:
     3
     3
    -1

To solve eigenvectors, we need the unique eigenvalues which are:
    -1
     3

Eigenvectors for eigenvalue:
 lambda = -1

The columns of the following matrix are a basis
for the solution space of homogeneous system
Ax = 0.

    -1
    -2
     1


The general solution is:

r * col(1)

ans =

    -1
    -2
     1
```

```
Eigenvectors for eigenvalue:
 lambda = 3

The columns of the following matrix are a basis
for the solution space of homogeneous system
Ax = 0.

     1     0
     1     0
     0     1


The general solution is:

r * col(1) + s * col(2)

ans =

     1     0
     1     0
     0     1
```

Problem 11

```
>> A = [7 -4 0;8 -5 0;-4 4 3]

A =

     7    -4     0
     8    -5     0
    -4     4     3

>> eig(A)

ans =

     3
    -1
     3

>> % These are eigenvalues
>>
>> lambda = unique(eig(A))

lambda =

    -1
     3
```

```
>> lambda(1)

ans =

    -1

>> homsoln(A - lambda(1) * eye(size(A)),1)
The columns of the following matrix are a basis
for the solution space of homogeneous system
Ax = 0.

    -1
    -2
     1
```

```
The general solution is:

r * col(1)

ans =

    -1
    -2
     1

>> % This is the eigenvector when the
>> % eigenvalue is -1
>>
>> lambda(2)

ans =

     3
```

```
>> homsoln(A - lambda(2) * eye(size(A)),1)
The columns of the following matrix are a basis
for the solution space of homogeneous system
Ax = 0.

     1     0
     1     0
     0     1


The general solution is:

r * col(1) + s * col(2)

ans =

     1     0
     1     0
     0     1

>> % These are the eigenvectors when the
>> % eigenvalue is 3
```