```
A=[0 2 1;1 0 2;1 2 0]          --Entering a matrix

A =

     0     2     1
     1     0     2
     1     2     0

B=[1 2 4 1;3 4 5 1;4 5 6 1]

B =

     1     2     4     1
     3     4     5     1
     4     5     6     1

u = [1;2;3]                    --Entering a column vector

u =

     1
     2
     3

v=[5;2;1]

v =

     5
     2
     1

A*B                              --Matrix multiplication

ans =

    10    13    16     3
     9    12    16     3
     7    10    14     3

A*u

ans =

     7
     7
     5

rref(A)                          -- row reduction

ans =

     1     0     0
     0     1     0
     0     0     1

rref(B)
```

```
ans =

     1     0     0    -1
     0     1     0     1
     0     0     1     0
```

```
inv(A)
```

-- matrix inverse

```
ans =

   -0.6667    0.3333    0.6667
    0.3333   -0.1667    0.1667
    0.3333    0.3333   -0.3333
```

```
rats(ans)
```

--change it to fractions

```
ans =

     -2/3          1/3          2/3
      1/3         -1/6          1/6
      1/3          1/3         -1/3
```

```
B'
```

--transpose. (technically, this does conjugate-transpose. For non-imaginary matrices, this is the same thing.)

```
ans =

     1     3     4
     2     4     5
     4     5     6
     1     1     1
```

```
eig(A)
```

--eigenvalues

```
ans =

   -1.0000
    3.0000
   -2.0000
```

```
[V,D]=eig(A)
```

--eigenvalues and eigenvectors. The first matrix is the eigenvectors, and the second has the corresponding eigen-values down the diagonal.

```
V =

   -0.9045    0.5774    0.4851
    0.3015    0.5774   -0.7276
    0.3015    0.5774    0.4851


D =

   -1.0000         0         0
         0    3.0000         0
         0         0   -2.0000
```