```
% gda00_09
% example of the matrix inverse, determinant, eigenvalues
% supports Section I.4

% define a matrix and a vector
A = [ [1, 5, 13]', [2, 7, 17]', [3, 11, 19]'];
b = [1, 2, 3]';

A
```

```
A =

     1     2     3
     5     7    11
    13    17    19
```

```
% compute inverse
B = inv(A);
B
```

```
B =

   -2.2500    0.5417    0.0417
    2.0000   -0.8333    0.1667
   -0.2500    0.3750   -0.1250
```

```
% check result
A*B
```

```
ans =

    1.0000         0    0.0000
    0.0000    1.0000    0.0000
   -0.0000         0    1.0000
```

```
B*A
```

```
ans =

    1.0000    0.0000   -0.0000
         0    1.0000    0.0000
         0         0    1.0000
```

```
% determinant
d = det(A);
d
```

```
d = 24.0000
```

```
% solve b = A*c
c = A\b;
c
```

```
c =
```

```
   -1.0417
    0.8333
    0.1250
```

```
% check result
error=b-A*c;
error
```

```
error =

   1.0e-15
    0.1110
   -0.8882
    0.4441
```

```
% define matrix B
B = [ [1, 3, 4]', [2, 3, 2]', [0, 0, 4]'];
B
```

```
B =

     1     2     0
     3     3     0
     4     2     4
```

```
% D=B*inv(A)
D=B/A;
D
```

```
D =

    1.7500   -1.1250    0.3750
   -0.7500   -0.8750    0.6250
   -6.0000    2.0000    0.0000
```

```
% define symmetric matrix M
M = [ [1, 2, 0]', [2, 2, 0]', [0, 0, 4]'];
M
```

```
M =

     1     2     0
     2     2     0
     0     0     4
```

```
% eigenvalues and eigenvectors
[V,LAMBDA] = eig(M);
V
```

```
V =

   -0.7882    0.6154         0
    0.6154    0.7882         0
         0         0    1.0000
```

```
LAMBDA
```

```
LAMBDA =

   -0.5616         0         0
         0    3.5616         0
         0         0    4.0000
```

```
% check orthonormality
V'*V
```

```
ans =

     1     0     0
     0     1     0
     0     0     1
```