

```
>> A = [0.98, 0.04;  
0.02, 0.96]
```

```
A =
```

```
    0.9800    0.0400  
    0.0200    0.9600
```

```
>> x = [0.5; 0.5]
```

```
x =
```

```
    0.5000  
    0.5000
```

```
>> A*x
```

```
ans =
```

```
    0.5100  
    0.4900
```

```
>> A^10*x
```

```
ans =
```

```
    0.5769  
    0.4231
```

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

```
V =
```

```
    0.8944   -0.7071  
    0.4472    0.7071
```

```
D =
```

```
    1.0000     0  
     0    0.9400
```

```
>> v1 = V(:,1)
```

```
v1 =
```

```
    0.8944  
    0.4472
```

```
>> v1 = v1/sum(v1)
```

```
v1 =
```

0.6667
0.3333

>> % One-year Transition Probability Matrix (Standard & Poor's, January 2001)

```
P = [  
0.9366 0.0583 0.0040 0.0009 0.0002 0.0000 0.0000 0.0000;  
0.0066 0.9172 0.0694 0.0049 0.0006 0.0009 0.0002 0.0002;  
0.0007 0.0225 0.9176 0.0518 0.0049 0.0020 0.0001 0.0004;  
0.0003 0.0026 0.0483 0.8924 0.0444 0.0081 0.0016 0.0023;  
0.0003 0.0006 0.0044 0.0666 0.8323 0.0746 0.0105 0.0107;  
0.0000 0.0010 0.0032 0.0046 0.0572 0.8362 0.0384 0.0594;  
0.0015 0.0000 0.0029 0.0088 0.0191 0.1028 0.6123 0.2526;  
0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 1.0000  
];  
ratings = {'AAA', 'AA', 'A', 'BBB', 'BB', 'B', 'CCC', 'Default'};  
>> P = P'
```

```
P =  
  
0.9366 0.0066 0.0007 0.0003 0.0003 0 0.0015 0  
0.0583 0.9172 0.0225 0.0026 0.0006 0.0010 0 0  
0.0040 0.0694 0.9176 0.0483 0.0044 0.0032 0.0029 0  
0.0009 0.0049 0.0518 0.8924 0.0666 0.0046 0.0088 0  
0.0002 0.0006 0.0049 0.0444 0.8323 0.0572 0.0191 0  
0 0.0009 0.0020 0.0081 0.0746 0.8362 0.1028 0  
0 0.0002 0.0001 0.0016 0.0105 0.0384 0.6123 0  
0 0.0002 0.0004 0.0023 0.0107 0.0594 0.2526 1.0000
```

>> [V,D]=eig(P)

```
V =  
  
0 -0.0036 -0.0002 0.0220 -0.0081 -0.0456 0.1092 0.2031  
0 0.0020 0.0097 0.1232 0.1589 0.3790 -0.2481 0.3320  
0 -0.0009 -0.1159 0.3009 -0.5493 -0.4055 -0.3914 -0.0292  
0 -0.0241 0.3810 0.2498 0.6410 -0.3369 0.2452 -0.4563  
0 0.0247 -0.7038 0.1118 -0.0098 0.2755 0.3904 -0.3422  
0 -0.3552 0.5426 0.0809 -0.4316 0.5219 0.4335 -0.3100  
0 0.8145 0.0936 0.0126 -0.0676 0.0821 0.0680 -0.0485  
1.0000 -0.4574 -0.2069 -0.9012 0.2665 -0.4705 -0.6068 0.6511
```

```
D =  
  
1.0000 0 0 0 0 0 0 0  
0 0.5958 0 0 0 0 0 0  
0 0 0.7624 0 0 0 0 0  
0 0 0 0.9890 0 0 0 0  
0 0 0 0 0.8442 0 0 0  
0 0 0 0 0 0.8856 0 0  
0 0 0 0 0 0 0.9218 0  
0 0 0 0 0 0 0 0.9458
```

>>