C2 Python Code

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차 례

Method 1 - eigen-decomposition

```
p=np.array([0.7,0.5,0.3,0.5]).reshape(2,2)
lin.eig(p)
```

```
## (array([1. , 0.2]), array([[ 0.85749293, -0.70710678],
##        [ 0.51449576,  0.70710678]]))
```

```
x_1=lin.eig(p)[1][:,0]
x_1
```

```
## array([0.85749293, 0.51449576])
```

```
v=x_1/sum(x_1)
v
```

```
## array([0.625, 0.375])
```

Method 2 - system of linear equation

```
p=np.array([0.7,0.5,0.3,0.5]).reshape(2,2, order='F')
n=p.shape[0]
I=np.identity(n)
A=np.c_[p-I,np.repeat(1,n)]
b=np.concatenate((np.repeat(0,n),np.array([1])))

A
```

```
## array([[-0.3,  0.3,  1. ],
##        [ 0.5, -0.5,  1. ]])
```

```
b
```

```
## array([0, 0, 1])
```

```
v=lin.solve(A@A.T,A@b.T)
v
```

```
## array([0.625, 0.375])
```

Motivation (17p)

```
p=np.matrix([[0.7,0.3],[0.5,0.5]])
p
```

```
## matrix([[0.7, 0.3],
##         [0.5, 0.5]])
```

```
p@p
```

```
## matrix([[0.64, 0.36],
##         [0.6 , 0.4 ]])
```

```
p**3
```

```
## matrix([[0.628, 0.372],
##         [0.62 , 0.38 ]])
```

```
p**4
```

```
## matrix([[0.6256, 0.3744],
##         [0.624 , 0.376 ]])
```

```
p**20
```

```
## matrix([[0.625, 0.375],
##         [0.625, 0.375]])
```

Motivation (19p)

```
p=np.matrix([[0,1],[1,0]])
p
```

```
## matrix([[0, 1],
##         [1, 0]])
```

```
p**2
```

```
## matrix([[1, 0],
##         [0, 1]])
```

```
p**3
```

```
## matrix([[0, 1],
##         [1, 0]])
```