numpy的综合运用

In [1]:
```
import numpy as np
```

In [2]:
```
np.random.seed(1)
X = np.random.randint(1, 10, size=30)
```

In [3]:
```
X
```

Out[3]:
```
array([6, 9, 6, 1, 1, 2, 8, 7, 3, 5, 6, 3, 5, 3, 5, 8, 8, 2, 8, 1,
7, 8,
       7, 2, 1, 2, 9, 9, 4, 9])
```

In [4]:
```
y = X.reshape(-1, 3)
```

In [5]:
```
y
```

Out[5]:
```
array([[6, 9, 6],
       [1, 1, 2],
       [8, 7, 3],
       [5, 6, 3],
       [5, 3, 5],
       [8, 8, 2],
       [8, 1, 7],
       [8, 7, 2],
       [1, 2, 9],
       [9, 4, 9]])
```

In [6]:
```
y[0,-1]=6
y[0,-1]
y
```

Out[6]:
```
array([[6, 9, 6],
       [1, 1, 2],
       [8, 7, 3],
       [5, 6, 3],
       [5, 3, 5],
       [8, 8, 2],
       [8, 1, 7],
       [8, 7, 2],
       [1, 2, 9],
       [9, 4, 9]])
```

In [7]:
```
y[:, -1]    # 获取最后一列数据
```

Out[7]:
```
array([6, 2, 3, 3, 5, 2, 7, 2, 9, 9])
```

In [8]:
```
row = y[:, -1]<=3
row
```

Out[8]:
```
array([False,  True,  True,  True, False,  True, False,  True, Fal
se,
       False])
```

In [9]:
```
# 将最后一列小于等于3的修改为0
lower_3 = [i for i in range(len(row)) if row[i]==True]
lower_3
for i in lower_3:
    y[i,-1] = 0
y
```

Out[9]:
```
array([[6, 9, 6],
       [1, 1, 0],
       [8, 7, 0],
       [5, 6, 0],
       [5, 3, 5],
       [8, 8, 0],
       [8, 1, 7],
       [8, 7, 0],
       [1, 2, 9],
       [9, 4, 9]])
```

In [10]:
```
row2 = (y[:,-1]>3) & (y[:,-1]<=6)
row2
```

Out[10]:
```
array([ True, False, False, False,  True, False, False, False, Fal
se,
       False])
```

In [11]:
```
# 将最后一列大于3小于等于6的修改为0
three_to_six = [i for i in range(len(row2)) if row2[i]==True]
three_to_six
for i in three_to_six:
    y[i,-1] = 1
y
```

Out[11]:
```
array([[6, 9, 1],
       [1, 1, 0],
       [8, 7, 0],
       [5, 6, 0],
       [5, 3, 1],
       [8, 8, 0],
       [8, 1, 7],
       [8, 7, 0],
       [1, 2, 9],
       [9, 4, 9]])
```

In [12]:
```
row3 = y[:, -1]>6
row3
```

Out[12]:
```
array([False, False, False, False, False, False,  True, False,  Tr
ue,
        True])
```

In [13]:
```
# 将最后一列大于6的修改为0
higher_six = [i for i in range(len(row3)) if row3[i]==True]
higher_six
for i in higher_six:
    y[i,-1] = 2
y
```

Out[13]:
```
array([[6, 9, 1],
       [1, 1, 0],
       [8, 7, 0],
       [5, 6, 0],
       [5, 3, 1],
       [8, 8, 0],
       [8, 1, 2],
       [8, 7, 0],
       [1, 2, 2],
       [9, 4, 2]])
```

In [14]:
```
X_train = y[:,0:2]
X_train
```

Out[14]:
```
array([[6, 9],
       [1, 1],
       [8, 7],
       [5, 6],
       [5, 3],
       [8, 8],
       [8, 1],
       [8, 7],
       [1, 2],
       [9, 4]])
```

In [15]:
```
y_train = y[:,-1]
y_train
```

Out[15]:
```
array([1, 0, 0, 0, 1, 0, 2, 0, 2, 2])
```

In [16]:
```
# 分类为0的样本
select1 = [ i for i in range(len(y_train)) if y_train[i]==0 ]
X1 = X_train[select1]
X1
```

Out[16]:
```
array([[1, 1],
       [8, 7],
       [5, 6],
       [8, 8],
       [8, 7]])
```

In [17]:
```
# 分类为1的样本
select2 = [ i for i in range(len(y_train)) if y_train[i]==1 ]
X2 = X_train[select2]
X2
```

Out[17]:
```
array([[6, 9],
       [5, 3]])
```

In [18]:
```
# 分类为2的样本
select3 = [ i for i in range(len(y_train)) if y_train[i]==2 ]
X3 = X_train[select3]
X3
```

Out[18]:
```
array([[8, 1],
       [1, 2],
       [9, 4]])
```