numpy.tile()是个什么函数呢，说白了，就是把数组沿各个方向复制

比如 a = np.array([0,1,2]),    np.tile(a,(2,1))就是把a先沿x轴（就这样称呼吧）复制1倍，即没有复制，仍然是 [0,1,2]。 再把结果沿y方向复制2倍，即最终得到

 array([[0,1,2],

             [0,1,2]])

**numpy.tile(**A**,**reps**)**

Construct an array by repeating A the number of times given by reps.

If *reps* has length d, the result will have dimension of max(d, A.ndim).

If A.ndim < d, *A* is promoted to be d-dimensional by prepending new axes. So a shape (3,) array is promoted to (1, 3) for 2-D replication, or shape (1, 1, 3) for 3-D replication. If this is not the desired behavior, promote *A* to d-dimensions manually before calling this function.

If A.ndim > d, *reps* is promoted to *A*.ndim by pre-pending 1’s to it. Thus for an *A* of shape (2, 3, 4, 5), a *reps*of (2, 2) is treated as  (1, 1, 2, 2).

Note : Although tile may be used for broadcasting, it is strongly recommended to use numpy’s broadcasting operations and functions.

|  |  |
| --- | --- |
| **Parameters:** | A*: array\_like*  The input array.  reps*: array\_like*  The number of repetitions of *A* along each axis. |
| **Returns:** | c*: ndarray*  The tiled output array. |

**See also**

[repeat](https://docs.scipy.org/doc/numpy-dev/reference/generated/numpy.repeat.html#numpy.repeat)

Repeat elements of an array.

[broadcast\_to](https://docs.scipy.org/doc/numpy-dev/reference/generated/numpy.broadcast_to.html#numpy.broadcast_to)

Broadcast an array to a new shape

Examples

>>>

**>>>** a = np.array([0, 1, 2])

**>>>** np.tile(a, 2)

array([0, 1, 2, 0, 1, 2])

**>>>** np.tile(a, (2, 2))

array([[0, 1, 2, 0, 1, 2],

[0, 1, 2, 0, 1, 2]])

**>>>** np.tile(a, (2, 1, 2))

array([[[0, 1, 2, 0, 1, 2]],

[[0, 1, 2, 0, 1, 2]]])

>>>

**>>>** b = np.array([[1, 2], [3, 4]])

**>>>** np.tile(b, 2)

array([[1, 2, 1, 2],

[3, 4, 3, 4]])

**>>>** np.tile(b, (2, 1))

array([[1, 2],

[3, 4],

[1, 2],

[3, 4]])

>>>

**>>>** c = np.array([1,2,3,4])

**>>>** np.tile(c,(4,1))

array([[1, 2, 3, 4],

[1, 2, 3, 4],

[1, 2, 3, 4],

[1, 2, 3, 4]])