NumPy hstack()

Summary: in this tutorial, you'll learn how to use the NumPy `hstack()` function to join two or more arrays horizontally.

Introduction to the NumPy hstack() function

The `hstack()` function joins elements of two or more arrays (https://www.pythontutorial.net/python-numpy/create-numpy-array/) into a single array horizontally (column-wise).

The following shows the syntax of the `hstack()` function:

```
numpy.hstack((a1,a2,...))
```

In this syntax, the (a1, a2, ...) is a sequence of arrays with the `ndarray` type.

All arrays a1, a2, .. must have the same shape along all but the second axis. If all arrays are 1D arrays, then they can have any length.

If you want to join two or more arrays vertically, you can use the `vstack()` (https://www.pythontutorial.net/python-numpy/numpy-vstack/) function.

NumPy hstack() function examples

Let's take some examples of using the `hstack()` function.

1) Using numpy hstack() function to join elements of 1D arrays

The following example uses the `hstack()` function to join two 1D arrays horizontally:

```
import numpy as np

a = np.array([1, 2])
b = np.array([3, 4, 5])

c = np.hstack((a, b))
print(c)
```

Output:

```
[1 2 3 4 5]
```

Note that for 1D arrays, the input arrays can have different lengths as shown in the above example.

2) Using numpy hstack() function to join elements of 2D arrays

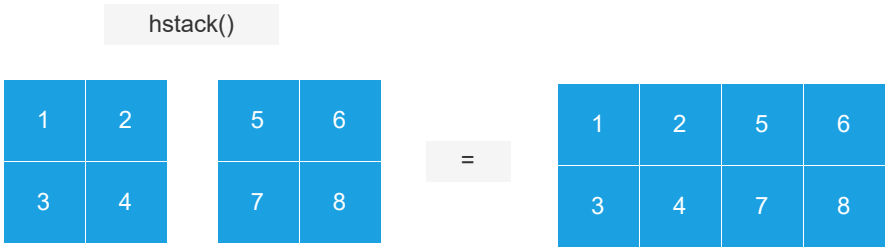
The following example uses the `hstack()` function to join elements of two 2D arrays:

```
import numpy as np

a = np.array([
    [1, 2],
    [3, 4]
])
b = np.array([
    [5, 6],
```

```
    [7, 8]
])

c = np.hstack((a, b))
print(c)
```



Output:

```
[[1 2 5 6]
 [3 4 7 8]]
```

Summary

- Use the numpy `hstack()` function to join two or more arrays horizontally.