NumPy ravel()

Summary: in this tutorial, you'll learn how to use the NumPy `ravel()` to return a contiguous flattened array.

Introduction to the NumPy ravel() function

The `ravel()` function accepts an array (https://www.pythontutorial.net/python-numpy/create-numpy-array/) and returns a 1-D array containing the elements of the input array:

```
numpy.ravel(a, order='C')
```

In this syntax:

- `a` is a numpy array. It can be any array-like object e.g., a list (https://www.pythontutorial.net/python-basics/python-list/) . An array-like object is an object that can be converted into a numpy array.
- `order` specifies the order of elements. Check out the `flatten()` (https://www.pythontutorial.net/python-numpy/numpy-flatten/) method for detailed information on the order parameter and its values.

NumPy ravel() function example

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

1) Using NumPy ravel() function to flatten an array

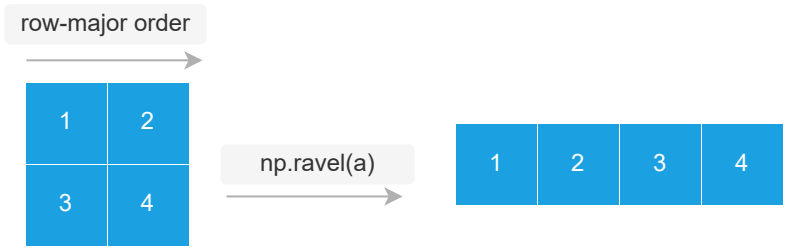
The following example uses the `ravel()` function to flatten a 2-D array:

```
import numpy as np

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

print(b)
```

Output:

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

How it works.



First, create a 2-D array:

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

Second, flatten the array using the `ravel()` function:

```
b = np.ravel(a)
```

Third, display the array:

```
print(b)
```

2) ravel() function vs. flatten() method

The `flatten()` method creates a copy of an input array while the `ravel()` function creates a view of the array. The `ravel()` only makes a copy of an array if needed. For example:

```
import numpy as np

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

# change element at index 0
b[0] = 0

# show both b & a array
print(b)
print(a)
```

How it works.

First, use the `ravel()` function to create a view of the array a:

```
b = np.ravel(a)
```

Second, change the element from index 0 of the array b to zero:

```
b[0] = 0
```

Third, show both arrays a and b. Since array b is a view of array a, the change in array b is reflected in array a:

```
print(b)
print(a)
```

Another important difference between the `flatten()` method and `ravel()` function is that you can call the `flatten()` method on a `ndarray` while you can call the `ravel()` function on an array-like object.

Summary

- Use the numpy `ravel()` function to return a contiguous flattened array.