NumPy Array Slicing

Slicing arrays

Slicing in python means taking elements from one given index to another given index.

We pass slice instead of index like this: [*start*:*end*].

We can also define the step, like this: [*start*:*end*:*step*].

If we don't pass start its considered 0

If we don't pass end its considered length of array in that dimension

If we don't pass step its considered 1

Slice elements from index 1 to index 5 from the following array:

import numpy as np  
  
arr = np.array([1, 2, 3, 4, 5, 6, 7])  
  
print(arr[1:5])

Example

Slice elements from index 4 to the end of the array:

import numpy as np  
  
arr = np.array([1, 2, 3, 4, 5, 6, 7])  
  
print(arr[4:])

Example

Slice elements from the beginning to index 4 (not included):

import numpy as np  
  
arr = np.array([1, 2, 3, 4, 5, 6, 7])  
  
print(arr[:4])

[Try it Yourself »](https://www.w3schools.com/python/numpy/trypython.asp?filename=demo_numpy_array_slicing5)

Negative Slicing

Use the minus operator to refer to an index from the end:

Example

Slice from the index 3 from the end to index 1 from the end:

import numpy as np  
  
arr = np.array([1, 2, 3, 4, 5, 6, 7])  
  
print(arr[-3:-1])

[Try it Yourself »](https://www.w3schools.com/python/numpy/trypython.asp?filename=demo_numpy_array_slicing_negative)

STEP

Use the step value to determine the step of the slicing:

Example

Return every other element from index 1 to index 5:

import numpy as np  
  
arr = np.array([1, 2, 3, 4, 5, 6, 7])  
  
print(arr[1:5:2])

[Try it Yourself »](https://www.w3schools.com/python/numpy/trypython.asp?filename=demo_numpy_array_slicing2)

Example

Return every other element from the entire array:

import numpy as np  
  
arr = np.array([1, 2, 3, 4, 5, 6, 7])  
  
print(arr[::2])

[Try it Yourself »](https://www.w3schools.com/python/numpy/trypython.asp?filename=demo_numpy_array_slicing3)

Slicing 2-D Arrays

Example

From the second element, slice elements from index 1 to index 4 (not included):

import numpy as np  
  
arr = np.array([[1, 2, 3, 4, 5], [6, 7, 8, 9, 10]])  
  
print(arr[1, 1:4])

[Try it Yourself »](https://www.w3schools.com/python/numpy/trypython.asp?filename=demo_numpy_array_slicing_2d)

**Note:** Remember that *second element* has index 1.

Example

From both elements, return index 2:

import numpy as np  
  
arr = np.array([[1, 2, 3, 4, 5], [6, 7, 8, 9, 10]])  
  
print(arr[0:2, 2])

[Try it Yourself »](https://www.w3schools.com/python/numpy/trypython.asp?filename=demo_numpy_array_slicing_2d2)

Example

From both elements, slice index 1 to index 4 (not included), this will return a 2-D array:

import numpy as np  
  
arr = np.array([[1, 2, 3, 4, 5], [6, 7, 8, 9, 10]])  
  
print(arr[0:2, 1:4])

[Try it Yourself »](https://www.w3schools.com/python/numpy/trypython.asp?filename=demo_numpy_array_slicing_2d3)