



How to convert NumPy array to list ?



This article will guide you through the process of convert a NumPy array to a list in [Python](#), employing various methods and providing detailed examples for better understanding.

Convert NumPy Array to List

There are various ways to convert [NumPy Array](#) to List here we are discussing some generally used methods to convert NumPy array to list:

- Using [Type Casting](#)
- Using [tolist\(\)](#) Method
- Using [list\(\)](#) Constructor
- Using [list Comprehension](#)
- Using [append\(\)](#) Method

Convert NumPy Array to List using Type Casting

Here we are creating a Numpy array using the [np.array](#) and printing the array before the conversion and after the conversion using Python typecasting to list using [list\(\) function](#).

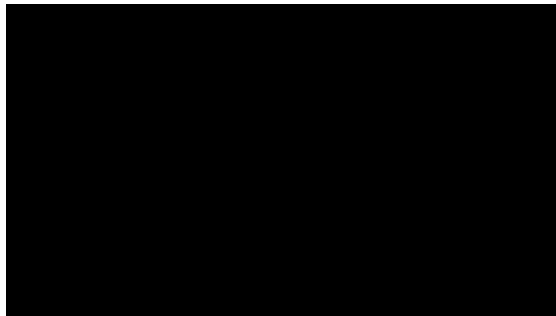
Python3

```
# import module
import numpy as np

# create array
arr = np.array([1, 2, 4, 5])
print("Before conversion: ", arr)
print(type(arr))

# Converting numpy to list
arr = list(arr)
print("\nAfter conversion: ", type(arr))
print(arr)
```

Output:



```
Before conversion: [1 2 4 5]
<class 'numpy.ndarray'>
After conversion: <class 'list'>
[1, 2, 4, 5]
```

Convert NumPy Array to List using tolist() Method

Example 1: With One Dimensional Array

Here code uses [NumPy](#) to create an array, prints the array and its type, converts the array to a Python list using the `tolist()` method, and prints the resulting list along with its type.

Python3

```
# import module
import numpy as np

# create array
print("\nArray:")
arr = np.array([1, 2, 4, 5])
print(arr)
print(type(arr))

# apply method
lis = arr.tolist()

# display list
print("\nList:")
print(lis)
print(type(lis))
```

Output:

```
Array:
[1 2 4 5]
<class 'numpy.ndarray'>
List:
[1, 2, 4, 5]
<class 'list'>
```

Example 2: With Multidimensional Array

Here The code uses NumPy to create a 2D array, prints the array and its type, converts the 2D array to a nested Python list using the `'tolist()'` method, and prints the resulting list along with its type.

Python3

```
# import module
import numpy as np

# create array
print("\nArray:")
arr = np.array([[1, 2, 3],
                [4, 5, 6],
                [7, 8, 9]])

print(arr)
```

```
print(type(arr))

# apply method
lis = arr.tolist()

# display list
print("\nList:")
print(lis)
print(type(lis))
```

Output:

```
Array:
[[1 2 3]
 [4 5 6]
 [7 8 9]]
<class 'numpy.ndarray'>
List:
[[1, 2, 3], [4, 5, 6], [7, 8, 9]]
<class 'list'>
```

Convert NumPy Array to List using list() Constructor

Here the code utilizes NumPy to create an array, then employs the [list\(\)](#) constructor to convert the array to a [Python list](#). It subsequently prints both the NumPy array and the resulting list, along with their respective types, demonstrating the conversion process.

Python3

```
# Import module
import numpy as np

# Create NumPy array
num_array = np.array([1, 2, 3, 4, 5])

# Convert NumPy array to list using list() constructor
list_from_array = list(num_array)

# Display the result
print("NumPy Array:")
print(num_array)
```

```
print("Type of NumPy Array:", type(num_array))

print("\nList from NumPy Array:")
print(list_from_array)
print("Type of List:", type(list_from_array))
```

Output :

```
NumPy Array:
[1 2 3 4 5]
Type of NumPy Array: <class 'numpy.ndarray'>
List from NumPy Array:
[1, 2, 3, 4, 5]
Type of List: <class 'list'>
```

Convert NumPy Array to List using list Comprehension

Here the code utilizes NumPy to create an array, then employs list comprehension to convert the array into a Python list, and finally prints both the original NumPy array and the converted list.

Python3

```
import numpy as np

# Create a NumPy array
numpy_array = np.array([1, 2, 3, 4, 5])

# Convert NumPy array to list using list comprehension
list_from_array = [element for element in numpy_array]

# Display the original array and the converted list
print("NumPy Array:", numpy_array)
print("List from NumPy Array:", list_from_array)
```

Output :

```
NumPy Array: [1 2 3 4 5]
List from NumPy Array: [1, 2, 3, 4, 5]
```

Convert NumPy Array to List using `append()` Method

Here the code uses NumPy to create an array, then converts it to a Python list by iterating through its elements and appending them using [append\(\)](#) method to an initially empty list. The original array and the resulting list are printed for verification.

Python3

```
import numpy as np

# Create a NumPy array
arr = np.array([1, 2, 3, 4, 5])

# Initialize an empty list
list_from_array = []

# Use append() to add elements to the list one by one
for element in arr:
    list_from_array.append(element)

# Print the original array and the converted list
print("Original NumPy Array:", arr)
print("List Converted from NumPy Array:", list_from_array)
```

Output :

```
Original NumPy Array: [1 2 3 4 5]
List Converted from NumPy Array: [1, 2, 3, 4, 5]
```

Conclusion

In conclusion, the process of converting a [NumPy](#) array to a list provides flexibility and compatibility within Python programming. By utilizing methods such as ``tolist()`` or employing iterative techniques like appending elements, developers can seamlessly transition between these two data structures. This versatility is particularly valuable in scenarios where the distinct functionalities of lists are required, allowing for efficient data manipulation and integration into various Python applications.

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1



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