

What is NumPy? Why should we use it?

NumPy is a powerful library for numerical computing in Python. It stands for "Numerical Python" and provides support for arrays, matrices, and many mathematical functions to operate on these data structures. Here are a few reasons why you might want to use NumPy:

1. Efficiency: NumPy arrays are more efficient than Python lists in terms of both memory usage and performance.
2. Functionality: It provides many functions for performing operations on arrays, such as mathematical, logical, shape manipulation, sorting, selecting, I/O, discrete Fourier transforms, and more.
3. Interoperability: It can integrate with a wide variety of databases, and it's essential for data science libraries like pandas, SciPy, and scikit-learn.
4. Convenience: Provides a lot of built-in functions and capabilities, which makes it easier to perform complex computations.

Write the steps to create 2D, and 3D array with output.

Creating a 2D Array

```
import numpy as np

# Create a 2D array (matrix)
array_2d = np.array([[1, 2, 3], [4, 5, 6]])

print("2D Array:")
print(array_2d)
```

Output:

```
2D Array:
[[1 2 3]
 [4 5 6]]
```

Creating a 3D Array

```
import numpy as np

# Create a 3D array
array_3d = np.array([[[1, 2, 3], [4, 5, 6]],
                     [[7, 8, 9], [10, 11, 12]]])

print("3D Array:")
print(array_3d)
```

Output:

```
3D Array:
[[[ 1  2  3]
  [ 4  5  6]]
 [[ 7  8  9]
  [10 11 12]]]
```