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]]]