# Practical No 18

## Aim

Write a Python program to create a 1D, 2D, and 3D NumPy array. Perform basic operations like reshaping, slicing, and indexing

## Apparatus / Software Required

- Python Interpreter (Python 3.14.2)

## Theory

🔹 NumPy is a powerful library in Python used for numerical computations. It provides support for multi-dimensional arrays and various operations on them.

**In this practical, we create:**

- 1D Array (one-dimensional)
- 2D Array (matrix form)
- 3D Array (multi-layer array)

**We also perform operations like:**

- Reshaping
- Slicing
- Indexing

**These operations are widely used in:**

- Data analysis
- Machine learning
- Scientific computing

### 🔹 Important Methods Used

⭐ 1. `np.array()` (Most Important)

- Used to create NumPy arrays
- np.array(data)
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### ⭐ 2. `reshape()`

- Changes the shape of an array
- array.reshape(rows, columns)

👉 Important for converting 1D → 2D or higher dimensions.

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### ⭐ 3. Indexing

- Access specific elements using index
- array[index]

👉 Used to get individual values.

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### ⭐ 4. Slicing

- Extract a portion of array
- array[start:end]

👉 Used to access subset of data.

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### 🔸 5. `np.arange()` (Optional)

- Creates array with range of numbers

## 🧾 Algorithm

1. Start
2. Import NumPy library
3. Create a 1D array
4. Create a 2D array
5. Create a 3D array
6. Perform reshaping on array
7. Perform indexing
8. Perform slicing
9. Display outputs
10. Stop

# Program Code

## Output

## Conclusion