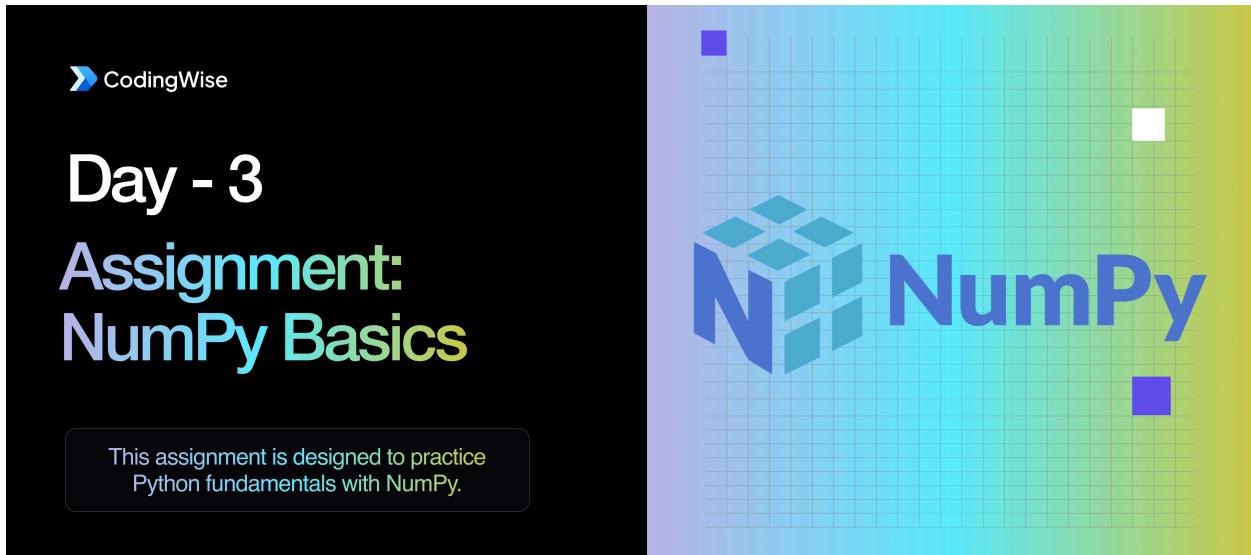


Day-3 Assignment: NumPy Basics



The image is a composite of two parts. On the left, a black rectangular area contains the CodingWise logo (a blue arrow icon) and the text "Day - 3 Assignment: NumPy Basics". Below this, in a white rounded rectangle, is a descriptive text: "This assignment is designed to practice Python fundamentals with NumPy.". On the right, there is a large, stylized 3D "N" logo composed of blue and teal cubes, set against a background of a grid with a color gradient from purple to yellow.

This assignment will help you practice Python basics with NumPy.

Topics included: `input`, `int`, `str`, `float`, `if-else`, `operators`, `np.array()`, `np.zeros()`, `np.ones()`, `.size`, `.shape`, `.ndim`, `.dtype`, `.astype()`, `np.mean()`, `np.median()`, `np.std()`, `np.var()`, `np.min()`, `np.max()`, `np.add()`, `np.subtract()`, `np.multiply()`, `np.divide()`

Section A – Array Creation & Basics

1. Take 3 numbers from the user and store them in a NumPy array. Print the array.

Hint: Use `np.array()` with `input()`.

2. Create a 1D array of 5 integers using NumPy. Print its size.

Hint: Use `.size`.

3. Create a 2×3 array filled with zeros.

Hint: Use `np.zeros((rows, cols))`.

4. Create a 3×2 array filled with ones.

Hint: Use `np.ones((rows, cols))`.

5. Take 2 integers from the user and create an array. Print its shape.

Hint: Use `.shape`.

Section B – Array Properties

1. Create a NumPy array `[1, 2, 3, 4]`. Print its number of dimensions.

Hint: Use `.ndim`.

2. Take 4 numbers as input, create an array, and print its data type.

Hint: Use `.dtype`.

3. Convert an integer array into float type.

Hint: Use `.astype(float)`.

Section C – Arithmetic Operations

1. Create two arrays `[1, 2, 3]` and `[4, 5, 6]`. Add them element-wise.

Hint: Use `+` or `np.add()`.

2. Multiply two arrays `[2, 4, 6]` and `[1, 3, 5]`.

Hint: Use `` or `np.multiply()`.*

3. Divide `[10, 20, 30]` by `[2, 5, 10]`.

Hint: Use `/` or `np.divide()`.

4. Subtract `[5, 10, 15]` from `[20, 30, 40]`.

Hint: Use `-` or `np.subtract()`.

5. Take 2 numbers from the user, put them in an array, and print the square of each.

*Hint: Use `** 2`.*

Section D – If-Else with Arrays

1. Take 3 marks from user, find average, and check if student passed (≥ 40).

Hint: Use `np.mean()` + if-else.

2. Take 3 numbers, find maximum, and check if it is greater than 100.

Hint: Use `np.max()` + if-else.

3. Take 5 numbers as input, check if the array size is greater than 4.

Hint: Use `.size` + if-else.

4. Compare averages of two arrays given by user and print which is higher.

Hint: Use `np.mean()` + if-else.

5. Create an array of 3 numbers. If the minimum value is less than 0, print "Negative number exists".

Hint: Use `np.min()` + if-else.

Section E – Statistical Functions

1. Find the average of `[10, 20, 30, 40, 50]`.

Hint: Use `np.mean()`.

2. Find the median of `[7, 2, 9, 1, 6]`.

Hint: Use `np.median()`.

3. Find the standard deviation of `[10, 12, 23, 23, 16, 23, 21, 16]`.

Hint: Use `np.std()`.

4. Find the variance of `[2, 4, 6, 8, 10]`.

Hint: Use `np.var()`.

5. Find the maximum salary from `[25000, 40000, 35000, 28000]`.

Hint: Use `np.max()`.

6. Find the minimum temperature from `[32, 28, 30, 27, 29]`.

Hint: Use `np.min()`.

Section F – Small Applications

1. Take 3 exam scores from the user. If the average is more than 90, print "Grade A". Else print "Grade B".

Hint: Use `np.mean()` + if-else.

2. Ask the user for 2 ages. Find which is larger using NumPy.

Hint: Use `np.max()`.

3. Create an array of 3 numbers. If all numbers are even, print "Even array". Otherwise, print "Mixed".

Hint: Use `% 2` with if-else.

4. Ask the user to enter 2 salaries. Print both and show their difference.

Hint: Use `np.subtract()`.

5. Create an array of `[3, 6, 9]`. Multiply every element by 10.

Hint: Use `` operator.*

6. Take 3 floating-point numbers from the user. Convert them into integers using NumPy.

Hint: Use `.astype(int)`.

1. Array Creation

```
import numpy as np

# From list
arr = np.array([1, 2, 3])

# Zeros & Ones
np.zeros((rows, cols)) # np.zeros((2,3)) → 2×3 all zeros
np.ones((rows, cols)) # np.ones((3,2)) → 3×2 all ones
```

2. Array Properties

```
arr.shape    # Dimensions (rows, cols)
arr.ndim     # Number of dimensions (1D, 2D...)
arr.size     # Total elements
arr.dtype    # Data type (int, float, etc.)
arr.astype(float) # Convert to float
arr.astype(int)  # Convert to int
```

3. Arithmetic Operations

```
a = np.array([1, 2, 3])
b = np.array([4, 5, 6])

a + b      # element-wise addition
a - b      # subtraction
a * b      # multiplication
a / b      # division
a ** 2     # power (square)

np.add(a, b)    # addition
np.subtract(a, b) # subtraction
np.multiply(a, b) # multiplication
np.divide(a, b)  # division
```

4. Statistical Functions

```
arr = np.array([10, 20, 30, 40])

np.mean(arr)   # Average
np.median(arr) # Middle value
np.std(arr)    # Standard deviation
```

```
np.var(arr)    # Variance  
np.min(arr)   # Smallest value  
np.max(arr)   # Largest value
```

5. If-Else with NumPy

```
arr = np.array([10, 20, 30])  
avg = np.mean(arr)  
  
if avg > 50:  
    print("Average is greater than 50")  
else:  
    print("Average is less or equal to 50")  
  
if np.max(arr) > 100:  
    print("Large value found")
```