

NumPy Exercises

1. Array Creation and Basic Operations

Task: Create a 1D NumPy array containing numbers from 1 to 10. Then, calculate the sum and product of all elements in the array.

2. Array Indexing and Slicing

Task: Create a 1D array with numbers from 0 to 20. Extract the elements from index 3 to 8.

3. 2D Array Manipulation

Task: Create a 5x5 array with values from 0 to 24. Extract the first two rows and the last two columns.

4. Element-wise Mathematical Operations

Task: Create two arrays: `a = [1, 2, 3, 4]` and `b = [2, 4, 6, 8]`. Perform element-wise addition, multiplication, and calculate the sine of each element in `b`.

5. Fancy Indexing and Boolean Masking

Task: Create a 1D array with random integers between 0 and 50 (size 20). Extract elements that are greater than 25 and less than 40 using boolean masking.

6. Multi-dimensional Array Challenge

Task: Create a 5x5 matrix using `np.arange(25).reshape(5, 5)`. Set the diagonal elements to zero and multiply all other elements by 2.

7. Array Slicing

Task: Create a 3x3 NumPy array with values from 1 to 9. Extract the second row and all columns

except the last one.

8. Transposing an Array

Task: Create a 2x3 array and transpose it.

9. Broadcasting

Task: Create a 3x3 array and a 1x3 array. Use broadcasting to add the 1x3 array to each row of the 3x3 array.

10. Fancy Indexing with 2D arrays

Task: Create a 4x4 array and use fancy indexing to extract the elements at positions (0, 1), (2, 3), and (3, 2).