Exercise 1: Array Creation

Create a 3x3 array with values ranging from 1 to 9.

Exercise 2: Indexing and Slicing

Given a 2D array `arr`, print the second row and the last column.

Exercise 3: Basic Operations

Multiply each element of an array `arr` by 2.

Exercise 4: Array Reshaping

Reshape a 1D array into a 2D array with 4 rows and 3 columns.

Exercise 5: Broadcasting

Subtract the mean of each column from a 2D array.

Exercise 6: Statistical Operations

Given an array `arr`, calculate the sum of all the elements.

Exercise 7: Element-wise Comparison

Create a boolean array indicating whether each element in an array `arr` is greater than 5.

Exercise 8: Element-wise Manipulation

Replace all even numbers in an array `arr` with -1.

Exercise 9: Concatenation

Concatenate two arrays: `arr1 = np.array([1, 2, 3])` and `arr2 = np.array([4, 5, 6])`.

Exercise 10: Stacking

Stack two arrays vertically and horizontally.

Exercise 11: Random Numbers

Generate a 3x3 array of random integers between 0 and 10.

Exercise 12: Matrix Operations

Perform matrix multiplication between two arrays: `matrix1 = np.array([[1, 2], [3, 4]])` and `matrix2 = np.array([[5, 6], [7, 8]])`.

Exercise 13: Sorting

Sort the elements of an array `arr` in ascending order.

Exercise 14: Finding Unique Values

Find the unique values in an array `arr`.

Exercise 15: Element-wise Arithmetic

Given an array `arr`, calculate the square root of each element.

Exercise 16: Reshape and Transpose

Given a 2D array `arr`, reshape it into a 1D array and then calculate its transpose.

Exercise 17: Matrix Inversion

Given a square matrix `A`, calculate its inverse (if it exists).

Exercise 18: Boolean Indexing

Given an array `arr`, create a new array containing only the elements that are divisible by both 3 and 5.

Exercise 19: Cumulative Sum

Given an array `arr`, calculate the cumulative sum of its elements.

Exercise 20: 3D Array Manipulation

Create a 3x3x3 array with random integers between 1 and 100, and then extract a 2x2 subarray from it.