

Numpy Question

Basic Questions

1. Array Creation: Create a 1D NumPy array with values from 0 to 9.
2. Array Shape: Create a 2D array (3x3) filled with zeros and print its shape.
3. Array Indexing: Given the array `arr = np.array([10, 20, 30, 40, 50])`, how would you access the third element?
4. Slicing: From the array `arr = np.array([1, 2, 3, 4, 5, 6, 7, 8, 9])`, slice and return the last three elements.
5. Array Arithmetic: Create two arrays `a = np.array([1, 2, 3])` and `b = np.array([4, 5, 6])`, then perform element-wise addition.
6. Reshape: Take the array `arr = np.array([1, 2, 3, 4, 5, 6])` and reshape it to a 2x3 array.
7. Boolean Indexing: Create an array of integers from 1 to 20. Use boolean indexing to get all even numbers.
8. Copying Arrays: Explain the difference between copying an array with `arr.copy()` and `arr[:]`.
9. Statistical Functions: Given the array `arr = np.array([1, 2, 3, 4, 5])`, calculate the mean, median, and standard deviation.
10. Concatenation: Given two arrays `a = np.array([1, 2, 3])` and `b = np.array([4, 5, 6])`, concatenate them into one array.

Simplified Questions

11. Matrix Multiplication: Create two 2D arrays with random integers and multiply them together using NumPy.
12. Transpose: Given a 2D array, find its transpose by swapping rows and columns.
13. Broadcasting: Give a simple example of adding a scalar (like 5) to an array and explain how it works.
14. Unique Elements: Create an array with some repeated numbers (like `[1, 2, 2, 3, 3, 3]`) and find the unique numbers using a NumPy function.
15. Sorting: Create an array with random numbers and sort it in ascending order.
16. Dot Product: Create two 1D arrays (like `[1, 2, 3]` and `[4, 5, 6]`) and calculate their dot product.
17. Fancy Indexing: Create a 5x5 array filled with random integers. Use simple indexing to extract a specific row and a specific column.
18. Element-wise Functions: Create an array of positive numbers and use `np.sqrt()` to calculate the square root of each element.
19. Solving Equations: Use NumPy to solve a simple equation of the form $2x+3=7$ and find the value of x .
20. Saving and Loading: Create a NumPy array and save it to a file using `np.save()`. Then load it back into a new array using `np.load()`.