

Here are the **50 NumPy exercises** for practice. Try solving them on your own before checking the solutions! 🚀

NumPy 50 Exercises

Basic NumPy Array Creation

1. Import the NumPy library and print its version.
2. Create a 1D NumPy array of numbers from 0 to 9.
3. Create a NumPy array of shape (3,3) filled with True values.
4. Create a NumPy array of numbers from 10 to 49.
5. Reverse a NumPy array (first element becomes last).
6. Create a 3x3 matrix with values ranging from 0 to 8.

Indexing & Slicing

7. Find indices of non-zero elements in the array `[1,2,0,0,4,0]`.
8. Create a 3x3 identity matrix (I).
9. Create a 3x3x3 array with random values.
10. Create a 10x10 array with random values and find the minimum & maximum.
11. Create a random vector of size 30 and find the mean value.

Array Manipulation

12. Create a 2D array with 1 on the border and 0 inside (shape 5x5).
13. Create a 8x8 checkerboard pattern (0 and 1 alternate).
14. Normalize a random 5x5 matrix (rescale values between 0 and 1).
15. Multiply a 5x3 matrix by a 3x2 matrix (matrix multiplication).
16. Extract the integer part of a random array of positive numbers.
17. Create a 5x5 matrix with row values ranging from 0 to 4.
18. Create a checkerboard pattern using NumPy's tile function.

Statistical & Mathematical Operations

19. Create a random vector of size 10 and replace max value with 0.
20. Create a structured NumPy array with `x`, `y` coordinates covering `[0,1] x [0,1]`.
21. Subtract the mean of a random vector from all elements.
22. Sort a random array of size 10.
23. Check if two random arrays are equal (element-wise).
24. Convert float array to integer array in NumPy.

Broadcasting & Advanced Indexing

25. Swap two rows in a 2D NumPy array.
26. Find common values between two arrays.
27. Remove all occurrences of a specific value from an array.

28. Find the nearest value in an array to a given scalar.
29. Replace all values greater than a given number in an array with that number.
30. Get the n largest values from an array.

Reshaping & Resizing

31. Convert a 1D array into a 2D array with 2 rows.
32. Stack two arrays vertically and horizontally.
33. Split a NumPy array into multiple sub-arrays.
34. Create a 2D array containing repeated elements.

Boolean Masking & Filtering

35. Find the positions of elements that satisfy a given condition.
36. Replace negative values in an array with zero.
37. Convert a boolean array to an integer array.
38. Get unique elements from an array.

NumPy Date & Time Functions

39. Create an array of dates for the month of February 2025.
40. Find the day of the week for each day in a NumPy date range.
41. Get the number of days between two dates in NumPy.

Linear Algebra & Eigenvalues

42. Compute the dot product of two random vectors.
43. Compute the determinant of a matrix.
44. Compute the eigenvalues and eigenvectors of a matrix.

Fourier Transform & Fast Computation

45. Compute the Fast Fourier Transform (FFT) of a given array.

Miscellaneous Operations

46. Generate a Gaussian-distributed random array.
47. Count the occurrences of a unique value in an array.
48. Convert a NumPy array to a Python list.
49. Save and load a NumPy array to/from a file.
50. Create a function that applies a rolling window mean to an array.