NumPy Coding Practice Questions

Basic Operations

1. Create a 1D NumPy array containing integers from 1 to 10.
2. Create a 3x3 matrix of all zeros and then fill the diagonal with ones.
3. Generate a 4x4 array of random integers between 0 and 20.
4. Create a 1D array of 20 linearly spaced points between 0 and 5.
5. Reshape a 1D array of size 12 into a 3x4 matrix.

Array Indexing & Slicing

6. Extract all even numbers from a 1D NumPy array [1, 2, 3, 4, 5, 6, 7, 8, 9].
7. Reverse a 1D NumPy array [1, 2, 3, 4, 5] using slicing.
8. Replace all elements greater than 10 in an array with the value 10.
9. Access the second column of a 4x4 matrix.

Mathematical Operations

10. Multiply each element of an array [1, 2, 3] by 3.
11. Compute the dot product of two 1D arrays [1, 2, 3] and [4, 5, 6].
12. Find the mean, median, and standard deviation of the array [10, 20, 30, 40].

Boolean Masking

13. Create a 1D array [5, 10, 15, 20] and filter elements greater than 12.
14. Replace all negative values in an array with 0.
15. Check if all elements in an array [1, 2, 3] are greater than 0.

Advanced Operations

16. Create a 5x5 identity matrix.

17. Stack two arrays [1, 2, 3] and [4, 5, 6] vertically and horizontally.

18. Flatten a 2D matrix into a 1D array.

19. Find the row-wise and column-wise sums of a 3x3 matrix.

20. Compute the eigenvalues and eigenvectors of a 2x2 matrix.