

Numpy -Interview Questions-Answers

1. What is NumPy?

NumPy is a Python library for numerical computing that provides efficient array operations.

2. What is the main object in NumPy?

The `ndarray` — a homogeneous, multidimensional array object.

3. How to install NumPy?

Use the command: `pip install numpy` .

4. What is the difference between list and NumPy array?

Lists are slower and heterogeneous; NumPy arrays are faster and homogeneous.

5. How to create an array in NumPy?

Using `np.array()` .

6. What is the shape of an array?

It's a tuple showing the number of elements in each dimension.

7. How to get data type of array elements?

Use `.dtype` attribute.

8. How to create arrays of zeros and ones?

`np.zeros()` and `np.ones()` .

9. What does `np.arange()` do?

Creates evenly spaced values within a given range.

10. What is `linspace()` used for?

Creates evenly spaced numbers between two values (includes both endpoints).

11. How to get array dimensions?

Use `.ndim` attribute.

12. How to reshape an array?

Use `.reshape(rows, cols)` method.

13. How to flatten an array?

Use `.ravel()` or `.flatten()` .

14. How to find max, min, and mean?

Use `np.max()` , `np.min()` , and `np.mean()` .

15. What is broadcasting in NumPy?

Automatic expansion of arrays for element-wise operations.

16. What is vectorization?

Performing operations on entire arrays without explicit loops.

17. How to find unique elements?

Use `np.unique()` .

18. How to join arrays?

Using `np.concatenate()` or `np.hstack()` , `np.vstack()` .

19. How to split arrays?

Using `np.split()` , `np.hsplit()` , `np.vsplit()` .

20. What is slicing in NumPy?

Extracting portions of an array using `[start:end:step]` .

21. How to transpose an array?

Use `.T` or `np.transpose()` .

22. What is the use of `np.dot()` ?

Performs matrix multiplication (dot product).

23. How to find standard deviation and variance?

Use `np.std()` and `np.var()` .

24. How to check for NaN values?

Use `np.isnan()` .

25. How to generate random numbers?

Using `np.random` module (e.g., `np.random.rand()` , `np.random.randint()`).

26. Create a NumPy array from a Python list.

```
import numpy as np
arr = np.array([1, 2, 3, 4, 5])
print(arr)
```

27. Create a 3×3 matrix of zeros.

```
arr = np.zeros((3,3))
print(arr)
```

28. Create a 2×4 matrix of ones.

```
arr = np.ones((2,4))
print(arr)
```

29. Create an array of 10 random integers between 1 and 100.

```
arr = np.random.randint(1, 101, 10)
print(arr)
```

30. Generate numbers from 0 to 10 with step 2.

```
arr = np.arange(0, 11, 2)
print(arr)
```

31. Create an array of 5 numbers evenly spaced between 0 and 1.

```
arr = np.linspace(0, 1, 5)
print(arr)
```

32. Get shape, size, and dimension of an array.

```
a = np.array([[1,2,3],[4,5,6]])
print(a.shape, a.size, a.ndim)
```

33. Reshape a 1D array to 2D (3×3).

```
a = np.arange(9).reshape(3,3)
print(a)
```

34. Flatten a 2D array to 1D.

```
a = np.arange(6).reshape(2,3)
print(a.ravel())
```

35. Find max, min, mean, and sum of array.

```
a = np.array([10, 20, 30])
print(a.max(), a.min(), a.mean(), a.sum())
```

36. Perform element-wise addition of two arrays.

```
a = np.array([1,2,3])
b = np.array([4,5,6])
print(a + b)
```

37. Multiply two matrices.

```
a = np.array([[1,2],[3,4]])
b = np.array([[5,6],[7,8]])
print(np.dot(a,b))
```

38. Create an identity matrix of size 4.

```
print(np.eye(4))
```

39. Find unique values in an array.

```
a = np.array([1,2,2,3,3,3])
print(np.unique(a))
```

40. Sort an array.

```
a = np.array([5, 2, 9, 1])
print(np.sort(a))
```

41. Stack two arrays vertically.

```
a = np.array([1,2,3])
b = np.array([4,5,6])
print(np.vstack((a,b)))
```

42. Stack two arrays horizontally.

```
a = np.array([[1],[2],[3]])
b = np.array([[4],[5],[6]])
print(np.hstack((a,b)))
```

43. Split an array into three equal parts.

```
a = np.arange(9)
print(np.split(a, 3))
```

44. Filter even numbers from an array.

```
a = np.arange(10)
print(a[a % 2 == 0])
```

45. Replace all odd numbers with -1.

```
a = np.arange(10)
a[a % 2 == 1] = -1
print(a)
```

46. Find indices of non-zero elements.

```
a = np.array([1,0,2,0,3])
print(np.nonzero(a))
```

47. Compute square root and exponential of array.

```
a = np.array([1,4,9])
print(np.sqrt(a), np.exp(a))
```

48. Compute mean along rows and columns.

```
a = np.arange(6).reshape(2,3)
print(a.mean(axis=0), a.mean(axis=1))
```

49. Generate a 4×4 random matrix and find its transpose.

```
a = np.random.randint(1,10,(4,4))
print("Original:\n", a)
print("Transpose:\n", a.T)
```

50. Replace NaN with zero in an array.

```
a = np.array([1, np.nan, 3, np.nan, 5])
a[np.isnan(a)] = 0
```