**Numpy**

1. Given an array [3, 1, 4, 1, 5, 9, 2, 6, 5, 3, 5], find the unique elements and their counts.

import numpy as np

arr = np. Array ([3, 1, 4, 1, 5, 9, 2, 6, 5, 3, 5])

np.unique(arr)

counts = np.unique(arr, return\_counts=True)

counts

2. Create a diagonal matrix with the elements [2, 4, 6] on the diagonal.

diagonal\_matrix = np.diag([2, 4, 6])

diagonal\_matrix

3. Given a 2D array, swap the first and second rows.

arr1 = np.arange(8).reshape(2,4)

print(arr1)

np.transpose(arr1)

4. Find the index of the maximum value in the array [8, 3, 7, 1, 2, 6, 5].

arr2 = np.array([8, 3, 7, 1, 2, 6, 5])

np.max(arr2)

5. Given a 1D array, find the indices where the values are even.

arr3 = np.array([0,1,2,3,4,5,6])

np.where(arr3%2==0)

6. Create a 5x5 matrix with 1 on the border and 0 inside.

arr4 = np.ones((5,5), dtype='int')

arr4[1:-1, 1:-1]=0

arr4

7. Given two arrays [1, 2, 3] and [4, 5, 6], perform element-wise multiplication.

ar1 = np.array([1,2,3])

ar2 = np.array([4,5,6])

multiplication = ar1 \*ar2

multiplication

8. Count the number of elements greater than 3 in the array [1, 4, 2, 7, 5, 0].

arr7 = np.array([1, 4, 2, 7, 5, 0])

count = np.sum(arr7 > 3)

count

9. Reshape the array [1, 2, 3, 4] into a 2x2 matrix.

ar7 = np.array([1, 2, 3, 4])

matrix = ar7.reshape(2,2)

matrix

10. Given two matrices A and B, check if they are element-wise equal. A = [[1, 2], [3, 4]] B = [[1, 2], [3, 4]]

a = np.array([[1, 2], [3, 4]])

b = np.array([[1, 2], [3, 4]])

equal = np.all(a==b)

equal

11. Calculate the mean along each row of a 2D array. [[1, 2, 3], [4, 5, 6], [7, 8, 9]]

rows = np. array([[1, 2, 3], [4, 5, 6], [7, 8, 9]])

np.mean(rows, axis=1)

12. Replace all odd numbers in the array [10, 15, 20, 25, 30] with -1.

arr = np.array([10, 15, 20, 25, 30])

arr[arr % 2 != 0] = -1

print(arr)