1. import numpy as np

print('NumPy Version:', np.__version__)

np.show_config()

2. help(np.add)

3. import numpy as np

arr = np.array([1, 2, 3, 0])

print(np.all(arr != 0))

4. import numpy as np

arr = np.array([0, 0, 1, 0])

print(np.any(arr != 0))

5. import numpy as np

arr = np.array([1, 2, np.inf, -np.inf, np.nan])

print(np.isfinite(arr))

6. import numpy as np

arr = np.array([1, 2, np.inf, -np.inf])

print(np.isinf(arr))

7. import numpy as np

arr = np.array([1, 2, np.nan])

print(np.isnan(arr))

8. import numpy as np

arr = np.array([1+2j, 2, 3.0])

print(np.iscomplex(arr))

print(np.isreal(arr))

print(np.isscalar(3.0))

9. import numpy as np

arr1 = np.array([1, 2, 3])

arr2 = np.array([1, 2.001, 3])

print(np.allclose(arr1, arr2, atol=0.01))

10. import numpy as np

arr1 = np.array([1, 2, 3])

arr2 = np.array([3, 2, 1])

print(arr1 > arr2)

print(arr1 >= arr2)

print(arr1 < arr2)

print(arr1 <= arr2)

11. import numpy as np

arr1 = np.array([1, 2, 3])

arr2 = np.array([1, 2, 3.001])

print(np.equal(arr1, arr2))

print(np.allclose(arr1, arr2, atol=0.01))

12. import numpy as np

arr = np.array([1, 7, 13, 105])

print('Memory size:', arr.nbytes, 'bytes')

13. import numpy as np

arr = np.array([0]*10 + [1]*10 + [5]*10)

print(arr)

14. import numpy as np

arr = np.arange(30, 71)

print(arr)

15. import numpy as np

arr = np.arange(30, 71, 2)

print(arr)

16. import numpy as np

arr = np.eye(3)

print(arr)

17. import numpy as np

rand_num = np.random.rand()

print(rand_num)

18. import numpy as np

arr = np.random.randn(15)

print(arr)

19. import numpy as np

arr = np.arange(15, 56)

print(arr[1:-1])

20. import numpy as np

arr = np.arange(12).reshape(3, 4)

for row in arr:

    print(row)

21. import numpy as np

arr = np.linspace(5, 50, 10)

print(arr)

22. import numpy as np

arr = np.arange(21)

arr[9:16] = -arr[9:16]

print(arr)

23. import numpy as np

arr = np.random.randint(0, 11, 5)

print(arr)

24. import numpy as np

arr1 = np.array([1, 2, 3])

arr2 = np.array([4, 5, 6])

print(arr1 * arr2)

25. import numpy as np

arr = np.arange(10, 22).reshape(3, 4)

print(arr)

26. import numpy as np

arr = np.arange(12).reshape(3, 4)

print('Rows:', arr.shape[0])

print('Columns:', arr.shape[1])

27. import numpy as np

arr = np.eye(3)

print(arr)

28. import numpy as np

arr = np.ones((10, 10))

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

print(arr)

29. import numpy as np

arr = np.zeros((5, 5))

np.fill_diagonal(arr, [1, 2, 3, 4, 5])

print(arr)

30. import numpy as np

arr = np.zeros((4, 4))

arr[::2, 1::2] = 1

arr[1::2, ::2] = 1

print(arr)

31. import numpy as np

arr = np.random.random((3, 3, 3))

print(arr)

32. import numpy as np

arr = np.arange(12).reshape(3, 4)

print('Sum of all elements:', arr.sum())

print('Sum of each row:', arr.sum(axis=1))

print('Sum of each column:', arr.sum(axis=0))

33. import numpy as np

arr1 = np.array([1, 2])

arr2 = np.array([3, 4])

print(np.dot(arr1, arr2))

34. import numpy as np

arr = np.arange(9).reshape(3, 3)

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

print(arr + vector[:, None])

35. import numpy as np

arr = np.arange(10)

np.save('array.npy', arr)

36. import numpy as np

arr = np.arange(10)

np.save('array.npy', arr)

print(np.load('array.npy'))

37. import numpy as np

arr = np.arange(10)

np.savetxt('array.txt', arr)

print(np.loadtxt('array.txt'))

38. import numpy as np

arr = np.arange(10)

bytes = arr.tobytes()

print(np.frombuffer(bytes, dtype=arr.dtype))

39. import numpy as np

lst = [1, 2, 3]

arr = np.array(lst)

print(list(arr) == lst)

40. import numpy as np

import matplotlib.pyplot as plt

x = np.linspace(0, 2 * np.pi, 100)

y = np.sin(x)

plt.plot(x, y)

plt.show()

41. import numpy as np

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

print(type(arr[0]))

42. import numpy as np

arr = np.array([[0, 1], [0, 2]])

arr[arr == 0] += 5

print(arr)

43. import numpy as np

arr = np.array([1, np.nan, 3])

print(np.isnan(arr))

44. import numpy as np

arr1 = np.array([1, 2, 3])

arr2 = np.array([1, 2, 4])

print(np.array_equal(arr1, arr2))

45. import numpy as np

arr = np.arange(10, 100)

print(arr)

46. import numpy as np

arr = np.random.uniform(0, 1, 40)

print(arr)

47. import numpy as np

arr = np.random.normal(200, 7, (8, 5))

print(arr)

48. import numpy as np

arr = np.arange(10)

print(np.random.choice(arr, 5, replace=False))

49. import numpy as np

arr = np.random.randint(0, 10, (4, 4))

arr[[0, -1]] = arr[[-1, 0]]

print(arr)

50. import numpy as np

arr = np.zeros((5, 6))

print(arr)

51. import numpy as np

arr = np.random.randint(0, 10, (3, 3))

print(np.sort(arr, axis=0))

print(np.sort(arr, axis=1))

52. import numpy as np

arr = np.random.randint(0, 100, 10)

print(arr[arr > 50])

53. import numpy as np

arr = np.random.randint(0, 10, 10)

arr[arr < 5] = 0

print(arr)

54. import numpy as np

arr = np.zeros_like(np.random.random((4, 4)))

print(arr)

55. import numpy as np

arr = np.zeros((3, 5, 4))

print(arr)

56. import numpy as np

arr = np.arange(16).reshape(4, 4)

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

print(arr)

57. import numpy as np

arr = np.arange(9).reshape(3, 3)

arr = arr[::-1, ::-1]

print(arr)

58. import numpy as np

arr1 = np.array([1, 2, 3])

arr2 = np.array([4, 5, 6])

print(arr1 * arr2)