**1.**

import numpy as np

from torch import dtype

**2.**

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

type(a) # numpy.ndarray

print(a.shape) # (3,)

print(a[0]) # 4

**3.**

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

print(b.shape) # (2, 3)

print(b[0,0]) # 4

print(b[0,1]) # 5

print(b[1,1]) # 2

**4.**

a = np.zeros((3,3),dtype=int)

b = np.ones((4,5),dtype=int)

c = np.identity(4)

d = np.random.randn(3,2)

**5.6.**

a = np.arange(1,13).reshape(3,4)

b = a[0:2, 1:3]

print(b[0, 0])

**7.**

c = a[1:3, :]

print(c[0][-1])

**8.**

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

print(a[[0,1,2],[0,1,0]])

**9.**

a = np.arange(1,13).reshape(4,3)

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

print(a[[np.arange(4),b]]) # [ 1 6 7 11]

**10.**

a[[np.arange(4),b]] += 10

var = a[[np.arange(4), b]] # array([21, 26, 27, 31])

**11.12.**

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

x =np.array([1.0,2.0])

print(x.dtype) # dtype('float64')

**13.**

x = np.array([[1, 2], [3, 4]], dtype=np.float64)

y = np.array([[5, 6], [7, 8]], dtype=np.float64)

print(x + y)

np.add(x,y)

**14.**

print(x-y)

np.subtract(x,y)

15.

print(x \* y) # 两个矩阵对应位置元素相乘

np.multiply(x,y) # 两个矩阵对应位置元素相乘

np.dot(x,y) # 矩阵相乘

**16.**

print(x / y)

np.divide(x,y)

**17.**

np.sqrt(x)

**18.**

print(x.dot(y))

print(np.dot(x,y))

print(np.sum(x)) # 10

**19.**

print(np.sum(x,axis=0)) # [4. 6.] 两列之和

print(np.sum(x,axis=1)) # [3. 7.] 两行之和

**20.**

print(np.mean(x))

print(np.mean(x,axis=0))

print(np.mean(x,axis=1))

**21.**

print(x.T)

print(x.T)

**22.**

np.exp(x) # 求e的x次方的值

**23.**

print(np.argmax(x))

print(np.argmax(x,axis=0))

print(np.argmax(x,axis=1))

**24.**

import matplotlib.pyplot as plt

x = np.arange(0,100,0.1)

y = x \* x

plt.figure(figsize=(6,6)) # 创建画布，并指定画布大小

plt.plot(x,y) # 在画布上画图

plt.show() # 展示画图结果

**25.**

x = np.arange(0,3\*np.pi,0.1)

y1 = np.sin(x)

y2 = np.cos(x)

plt.figure(figsize=(10,6))

plt.plot(x,y1,color='Red')

plt.plot(x,y2,color='Blue')

plt.legend(['Sin','Cos']) # 给两条线做标记

plt.show()