实验报告11

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实验名称：python语言程序练习题

实验要求：1.掌握矩阵的运算

2.用程序语言使图像呈现手绘效果

3.

实验结果：

1．

from numpy.linalg import inv

import numpy as np

a = np.array([[1,0.5,5],[2.3,2,3],[4,1,1.7]])

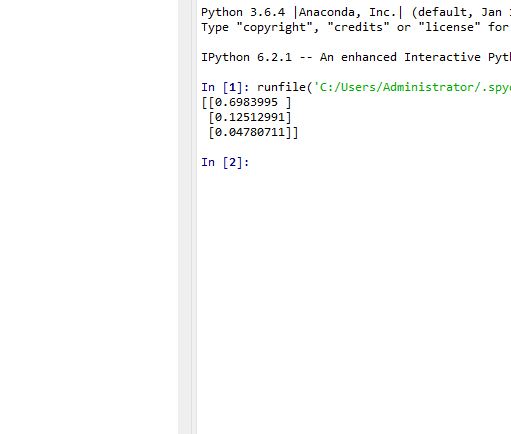
b = np.array([[1,2,3]])

bl = np.transpose(b)

al = inv(a)

x = np.matmul(al,bl)

print(x)



2.

from PIL import Image

import numpy as np

vec\_el = np.pi/2.2

vec\_az = np.pi/4.

depth = 120.

im = Image.open('D:/课堂练习/222.jpg').convert('L')

a = np.asarray(im).astype('float')

grad = np.gradient(a)

grad\_x, grad\_y = grad

grad\_x = grad\_x\*depth/100.

grad\_y = grad\_y\*depth/100.

dx = np.cos(vec\_el)\*np.cos(vec\_az)

dy = np.cos(vec\_el)\*np.sin(vec\_az)

dz = np.sin(vec\_el)

A = np.sqrt(grad\_x\*\*2 + grad\_y\*\*2 + 1.)

uni\_x = grad\_x/A

uni\_y = grad\_y/A

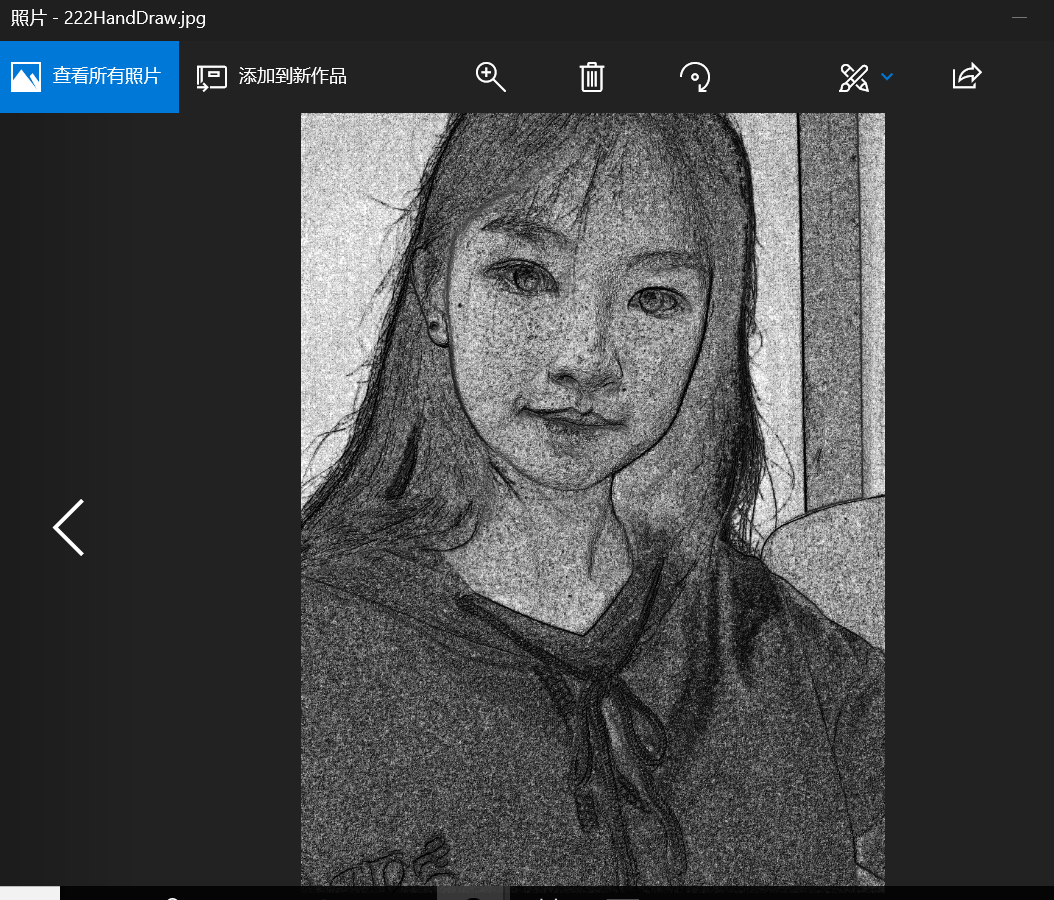
uni\_z = 1./A

a2 = 255\*(dx\*uni\_x + dy\*uni\_y + dz\*uni\_z)

a2 = a2.clip(0,255)

im2 = Image.fromarray(a2.astype('uint8'))

im2.save('222HandDraw.jpg')



3．

import numpy as np

import matplotlib.pyplot as plt

def squareWave(x,n):

f = np.zeros((x.shape[0],))

k = 1

while k <= n:

f = f + (4\*np.sin((2\*k-1)\*x) / ((2\*k-1)\*np.pi))

k = k + 1

return f

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

y = squareWave(x,8)

plt.plot(x,y)

plt.show()

