**实验报告**

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**实验名称**： 课后习题练习

**实验要求：熟练应用程序做题**

**实验题目：矩阵 手绘**

**算法实现：**

矩阵：

import numpy as np

from numpy.linalg import inv

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

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

x = np.matmul(inv(A),b)

print(x)

手绘：

from PIL import Image

import numpy as np

vec\_el = np.pi/2.2

vec\_az = np.pi/4.

depth = 10.

im = Image.open('123.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('fcityHandDraw.jpg')

**实验结果：**



