第一次实验报告

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1 python 入门基础实列

1.1 python 字符串

```
def test1():
word = ” 一个字符串”
print(word)
print(word+” 你好”)
print(word[:2:1])
print(word[0:-1])
```

```
一个字符串
一个字符串你好
一个
一个字符串
```

1.2 python 列表

```
def test2():
list = [1, 2, 'a', 3, '*', '&']
print(list)
print(list[0])
list[1] = 5
```

print(list[1])

```
[1, 2, 'a', 3, '*', '&']
1
5
```

1.3 python 元组

def test3():

num = (3, 4, 5, 6, 7)

num[0] = 5

```
    num[0] = 5
    ~~~^^^
TypeError: 'tuple' object does not support item assignment
```

1.4 set 集合

def test4():

sites = 'Google', 'Taobao', 'Runoob', 'Facebook', 'Zhihu', 'Baidu'

print()

a = set('abracadabra')

b = set('alcazam')

print(a | b)

print(b - a)

```
{'b', 'l', 'm', 'z', 'a', 'd', 'r', 'c'}
{'m', 'l', 'z'}
```

1.5 数据类型转换

def test5():

num_int = 123

num_flo = 1.23

a = 'a'

str = "123"

print(num_int)

print(num_flo)

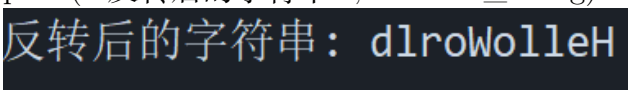
print(str)
num_int = str(num_int)
str = int(str)
print(num_int)
print(str)

1.6 字典

def test6():
tinydict1 = 'abc': 456
tinydict2 = 'abc': 123, 98.6: 37
print(tinydict2)
print("length:",len(tinydict2))
print(type(tinydict2))

1.7 字符串反转

def reverse_string(s):
return s[::-1]
string = "HelloWorld"
reversed_string = reverse_string(string)
print(" 反转后的字符串:", reversed_string)



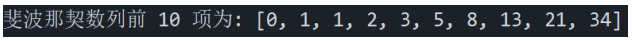
1.8 寻找列表里的最大值

def find_max(num_list):
max_num = num_list[0]
for num in num_list:
if num > max_num:
max_num = num
return max_num

```
def test8():
numbers = [5, 12, 8, 18, 3]
max_value = find_max(numbers)
print(" 最大值为:", max_value)
```

1.9 fibonacci 数列

```
def fibonacci(n):
fib_seq = [0, 1]
while len(fib_seq) < n:
fib_seq.append(fib_seq[-1] + fib_seq[-2])
return fib_seq
def test9():
num_terms = 10
fib_nums = fibonacci(num_terms)
print(" 斐波那契数列前", num_terms, " 项为:", fib_nums)
```

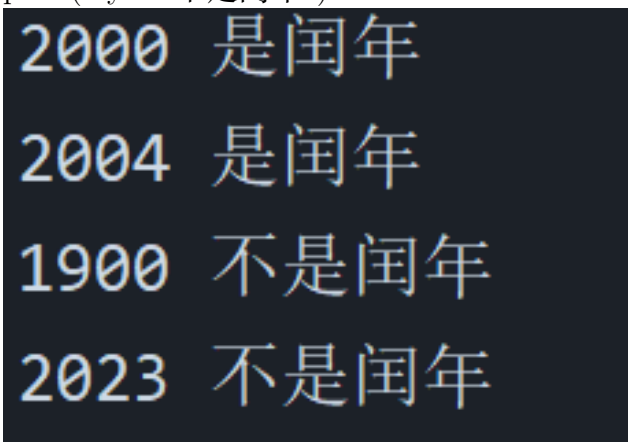


1.10 判断闰年

```
def is_leap_year(year):
if (year % 4 == 0 and year % 100!= 0) or year % 400 == 0:
return True
else:
return False

def test10():
years = [2000, 2004, 1900, 2023]
for year in years:
if is_leap_year(year):
print(f"year 是闰年")
```

else:
print(f”year 不是闰年”)



2 python 视觉应用实例

2.1 转换成灰度图像

pil_im = Image.open(’empire.jpg’).convert(’L’)

2.2 转换图像格式

for infile in filelist:
outfile=os.path.splitext(infile)[0]+”.jpg”
if infile != outfile
try:
Image.open(infile).save(outfile)

except IOError:
print ”cannot convert”, infile

2.3 创建略缩图

pil_im.thumbnail((128, 128))

2.4 复制和粘贴图像区域

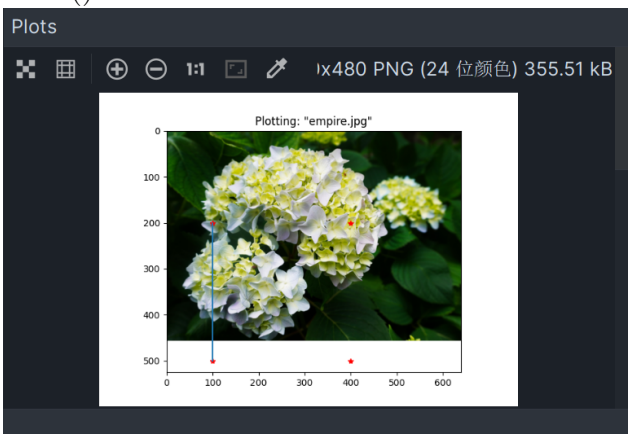
box = (100,100,400,400)
region = pil_im.crop(box)
region=region.transpose(Image.ROTATE_180)
pil_im.paste(region,box)

2.5 调整尺寸和旋转

```
out = pil_im.resize((128, 128))
out = pil_im.rotate(90)
out.show()
```

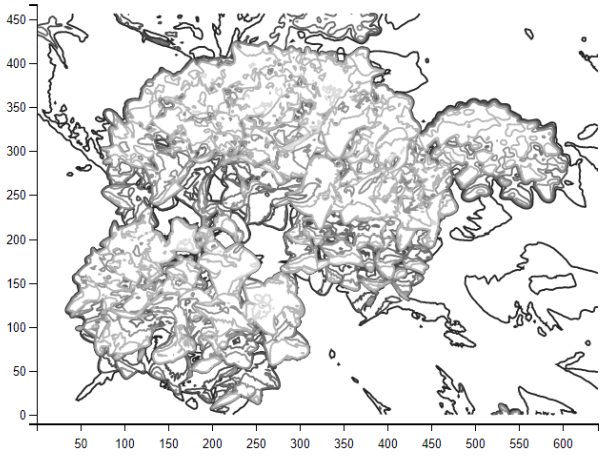
2.6 绘制图像、点和线

```
im = array(Image.open('empire.jpg'))
imshow(im)
x = [100, 100, 400, 400]
y = [200, 500, 200, 500]
plot(x, y, 'r*')
plot(x[:2], y[:2])
title('Plotting: "empire.jpg"')
show()
```



2.7 轮廓图

figure()
gray()
contour(im, origin='image')
axis('equal')
axis('off')



2.8 直方图

figure()
hist(im.flatten(), 128)