1.时间处理(P092)：求从给定时刻开始过了给定时间后的时刻。

解答：

import datetime

while True:

try:

dt = input()

if dt.count(" ") > 2:

year, month, day, hour, mini = map(int,dt.split())

nowtime = datetime.datetime(year, month,

day, hour, mini)

else:

nowtime = datetime.datetime.strptime(dt,

"%m-%d-%Y %I:%M %p")

# 由字符串生成

lst = input().split()

if len(lst) == 1:

delta = datetime.timedelta(seconds=int(lst[0]))

else:

day, hour, mini = map(int, lst)

delta = datetime.timedelta(days = day,

hours= hour,minutes=mini)

newtime = nowtime + delta

print(newtime.strftime("%Y-%m-%d %H:%M:%S"))

except Exception as e:

#print(e)

break

2.密码生成器：随机生成一万个密码。密码由大小写字母、数字和下划线这四类字符构成。要求密码介于8到10位之间，且必须包含这四类字符。要求密码具有一定的概率均等性，即统计10000个密码，所有字母出现的概率基本相同，所有数字出现的概率基本相同。每个密码里有且只能有1个下划线，位置也要随机，最多有4个数字。

解答：

# 2.密码生成器：随机生成一万个密码。密码由大小写字母、数字和下划线这四类字符构成。要求密码介于8到10位之间，且必须包含这四类字符。要求密码具有一定的概率均等性，即统计10000个密码，所有字母出现的概率基本相同，所有数字出现的概率基本相同。每个密码里有且只能有1个下划线，位置也要随机，最多有4个数字。

# 解答：

import random

letters = "abcdefghijklmnopqrstuvwxyz"

numbers = "0123456789"

def genCode():

L = random.randint(8,10)

digitNum = random.randint(1,4)

letterNum = L - 1 - digitNum

result = ["\_"]

for i in range(digitNum):

result.append(numbers[random.randint(0,9)])

for i in range(letterNum):

c = letters[random.randint(0, 25)]

if random.randint(0,1):

c = chr(ord(c) - ord('a') + ord("A"))

result.append(c)

random.shuffle(result)

return "".join(result)

for i in range(10000):

print(genCode())

3.用openpyxl处理excel文档：附件资源包中有一个多城市多月份多种商品销售情况的excel文档。指定特定城市和特定月份，请抽取该城市该月份的数据新建一个excel文档，对新文档的单元格样式有一定要求。

解答：

import openpyxl as pxl

from openpyxl.styles import Font,colors,

PatternFill,Alignment,Side,Border

import sys

if len(sys.argv) <= 1:

city = input("请输入要查询的城市：")

month = input("请输入要查询的月份：")

else:

city,month = sys.argv[1],int(sys.argv[2])

month = int(month)

book = pxl.load\_workbook(r"C:\diskd\aMyClasses\文科计算机\讲义\excel讲义\数据透视表.xlsx")

sheet = book["原数据"]

result = {}

cityFound = False

monthFound = False

for row in sheet[2:sheet.max\_row]:

dt,ct,product,num,sales,cost = row

numFormat = sales.number\_format

#dt = datetime.datetime.strptime(dt.value,r"%Y/%m/%d")

if ct.value.strip() == city:

cityFound = True

if month == dt.value.month:

monthFound = True

if product.value.strip() in result:

result[product.value.strip()][0] += \

num.value

result[product.value.strip()][1] += \

sales.value

result[product.value.strip()][2] += \

cost.value

else:

result[product.value.strip()] = \

[num.value,sales.value ,cost.value]

if not cityFound:

print("没有这个城市的销售记录")

exit()

if not monthFound:

print("该城市没有指定月份的销售记录")

exit()

filename = city + str(month) + "月销售情况.xlsx"

lst = list(result.items())

lst.sort(key = lambda x:-x[1][0])

book = pxl.Workbook()

sheet = book.active

sheet.title = filename

sheet.append(("产品类别","数量","销售额","成本","利润"))

i = 2

for x in lst:

r = [x[0],x[1][0],x[1][1],x[1][2]]

r.append("=C%d-D%d" % (i,i))

sheet.append(r)

i += 1

for row in sheet.rows:

for i in range(2,5):

row[i].number\_format = numFormat

for x in "CDE":

sheet.column\_dimensions[x].width = 14

for x in 'ABCDE':

sheet[x +"1"].fill = PatternFill(patternType='solid',

fgColor="00ff00")

book.save("c:/tmp/" + filename)

1.反转照片并添加拍摄时间：附件资源包中有一些照片，有的照片上下颠倒了。请在这些照片上面打上拍摄时间形成新照片。如果照片是上下颠倒的，那么要先颠倒过来。

解答：

import sys

import os

import time

from PIL import Image

from PIL import ImageDraw

from PIL import ImageFont

#设置所使用的字体

myFont= ImageFont.truetype("C:\Windows\Fonts\msmhei.ttf", 24)

def isDark(color): #color is rgba color

brightness = (color[0]/255 \* 299 + color[1]/255 \* 587 + \

color[2]/255 \* 114) / 1000

if brightness > 0.5:

return False

else:

return True

def isUpsideDown(data,w,h):

if h < 30:

return False

updark = 0

for i in range(10):

for j in range(w):

color = data[j,i]

if isDark(color):

updark+= 1

else:

updark -= 1

downdark = 0

for i in range(10):

for j in range(w):

color = data[j,h-1-i]

if isDark(color):

downdark+= 1

else:

downdark -= 1

if updark > 0 and downdark < 0:

return True

return False

def TimeStampToTime(timestamp):

timeStruct = time.localtime(timestamp)

#return time.strftime('%Y-%m-%d %H:%M:%S',timeStruct)

str = time.strftime('%Y-%m-%d',timeStruct)

pos = str.find("-")

str = str[:pos] + "年" + str[pos+1:]

pos = str.find("-")

str = str[:pos] + "月" + str[pos+1:] + "日"

return str

os.makedirs("result")

lst = os.listdir() #列出当前文件夹下所有文件和文件夹

for x in lst:

filePath = x

if os.path.isfile(filePath): #如果x是文件

if x.lower().endswith(".jpg") or \

x.lower().endswith(".png"):

t = os.path.getctime(filePath)

timeStr = TimeStampToTime(t)

img = Image.open(x)

w,h = img.size

fw,fh = myFont.getsize(timeStr)

#draw.text((0,0),timeStr)

imgRgba = img.convert('RGBA')

datalist = imgRgba.load()

print("w=%d,h=%d" % (w,h))

if isUpsideDown(datalist,w,h):

img = img.transpose(Image.FLIP\_TOP\_BOTTOM)

imgRgba = img.convert('RGBA')

datalist = imgRgba.load()

draw = ImageDraw.Draw (img)

dark = 0

for i in range(fw):

for j in range(fh):

color = datalist[w-fw+i,j + h-fh]

if isDark(color):

dark += 1

else:

dark -= 1

if dark > 0:

draw.text((w-fw, h-fh),timeStr , (255, 255, 255),

font=myFont)

else:

draw.text((w-fw, h-fh),timeStr , (0,0,0),

font=myFont)

img.save("result\\" + x[:-4] + ".png","png" )

#一律转成 png格式存

2.给照片加拍摄地址：手机拍摄的照片可能会有拍摄地点的gps经纬度坐标信息。附件资源包中给几张这样的照片，请编程提取经纬度，然后根据经纬度搜寻对应的地址(国家、城市、街道、门牌号等)，将地址打印在照片上形成新照片。

解答：

from PIL import Image,ImageDraw,ImageFont,ExifTags

from geopy.geocoders import Nominatim

def getExifData(img):

try:

if hasattr( img, '\_getexif' ): #hasattr是python函数

return img.\_getexif()

except :

return None

return None

def getExifKeyCode(keyStr):

for x in ExifTags.TAGS.items():

if x[1] == keyStr:

return x[0]

return None

def writeTextToImage(img,text,myFont):

#往照片文件 oldFileName中以字体myFont写入text并存为newFileName

w, h = img.size

fw, fh = myFont.getsize(text) #text的高度，宽度

draw = ImageDraw.Draw(img)

draw.text((w - fw, h - fh), text, (255, 255, 255),

font=myFont,)

#draw.rectangle((100,100,200,200),fill=135)

def getAddress(geolocator,coord):

try:

print("coord",coord )

location = geolocator.reverse(coord)

print(location.address)

adr = location.raw["address"]

print(adr)

return location.address

if "region" in adr:

return adr["region"]

elif "state" in adr:

return adr["state"]

else:

return ""

except Exception as e:

print(e)

return ""

def countDegree(d):

if type(d[0]) != tuple:

print("gps is float")

return float(d[0] + d[1]/60 + d[2] / 3600)

else:

print("gps is tuple")

return d[0][0]/d[0][1] + d[1][0]/d[1][1] / 60 + \

d[2][0]/d[2][1] / 3600

def makeCoordStr(gpsInfo):

NS,EW = gpsInfo[1],gpsInfo[3]

A = countDegree(gpsInfo[2])

L = countDegree(gpsInfo[4])

if NS == "S":

A = - A

if EW == "W":

L = - L

return str(A) + "," + str(L)

def correctOrientation(img):

# 根据exif判断，img里的图像如有颠倒或旋转则生成一幅将其摆正的图返回

if hasattr(img, "\_getexif"): # 判断img有没有\_getexif函数

exif = img.\_getexif() #获取图像exif信息,返回值是个字典

if exif != None:

orientation = exif[getExifKeyCode('Orientation')]

if orientation == 3: # 手机顶部朝右拍

img = img.rotate(180, expand=True)

elif orientation == 6: # 手机正常竖着拍(顶部朝上)

img = img.rotate(270, expand=True)

elif orientation == 8: # 手机顶部朝下拍

img = img.rotate(90, expand=True)

return img

def main():

# geolocator = Nominatim(user\_agent="kktfor\_text")

# print(getAddress(geolocator,("32.49196,100.6464")))

# print("ok,ok")

# exit()

myFont = ImageFont.truetype("C:\\Windows\\Fonts\\simhei.ttf",

60)

img = Image.open("c:/tmp/pic/iphone.jpg") #冰岛

#img = Image.open("c:/tmp/pic/20170809\_125846\_IP.JPG") #挪威

exif = getExifData(img)

img = correctOrientation(img)

if exif == None:

print("No exif data")

return

shootTime = exif[getExifKeyCode("DateTimeOriginal")]

# shootTime是字符串，格式： 2017:08:05 19:16:02

address = ""

gpsCode = getExifKeyCode('GPSInfo')

if gpsCode in exif:

geolocator = Nominatim(user\_agent="kktfor\_text")

gpsInfo = exif[gpsCode]

print(gpsInfo)

if 1 in gpsInfo:

coordStr = makeCoordStr(gpsInfo)

address = getAddress(geolocator,coordStr)

info = address + "\*\*\*\*" + shootTime

writeTextToImage(img, info,myFont)

img.show()

return

main()