Lab Report of Python Programming

Lab 6: Files and Exception Handling Credit hour: 2

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1. Objective
   1. Know how to open a file, read/write data from/to a file;
   2. Know the application of PIL(Python Image Library);
   3. Know the application of the standard library **csv** and **json** in Python.
2. Lab content
   1. (Create large dataset) Create a data file with 1000 lines. Each line in the file consists of a faculty first name, last name, rank, and salary. Faculty’s first name and last name for the ith line are FirstNamei and LastNamei. The rank is randomly generated as assistant, associate, and full. The salary is randomly generated as a number with two digits after the decimal point. The salary for assistant professor should be in the range from 50,000 to 80,000, for associate professor from 60,000 to 110,000, and for full professor from 75,000 to 130,000. Save the file in Salary.txt. Here are some sample data:

FirstName1 LastName1 assistant 60055.95  
FirstName2 LastName2 associate 81112.45  
. . .  
FirstName1000 LastName1000 full 92255.21

* 1. (PIL) By using Image class in PIL to realize

1. Extract each frame from a GIF file and save each frame as a separate file(seek() and save() method can be used).  
   Note: Try-Except should be used.
2. Exchange the color(RGB) of an image opened from a file which saved on the disk and save it again.
3. Get the contour of an image by using ImageFilter class and ImageEnhance class.
   1. (csv Library) By using the standard library **csv** to realize
4. Import the csv file saved on the disk to a list in the program.
5. Read line by line from a csv file saved on the disk, delete the comma in this file and print to the screen.
6. Write a one-dimensional data saved in a list to a specified csv file.
   1. (json Library) Write two programs to realize the exchanges between csv and json format.
7. Code list

2.1.py

#this file used to output the dataset

import random

#the rank

rank=["assistant","associate","full"]

#open file

datafile=open("data.txt",'w')

#output 1000 times

for i in range(1000):

rankName=rank[random.randint(0,2)]

salary=0.0

if rankName==rank[0]:

salary=random.random()\*30000+50000

elif rankName==rank[1]:

salary=random.random()\*50000+60000

else:

salary=random.random()\*55000+75000

datafile.write("FirstName%d LastName%d %s %.2f\n"%(i+1,i+1,rankName,salary))

datafile.close()

print("sucessfully write to file!")

2.2.py

from PIL import Image,ImageFilter

#get every frame of thr gif file

im=Image.open("a.gif")

cnt=0

im.seek(1)

try:

while 1:

im.seek(im.tell()+1)

newimage = Image.new('RGB', im.size)

newimage.paste(im)

newimage.save("%d.jpg"%(cnt))

cnt+=1

except EOFError:

pass

#Exchange the color(RGB) of an image

im1=Image.open("b.jpg")

x,y=im1.size

for i in range(x):

for k in range(y):

r,g,b=im1.getpixel((i,k))

if b>r and b>g:

b=0

r=0

g=0

im1.putpixel((i,k),(r,g,b))

im1.save("exchanged\_image.jpg")

#Get the contour of an image

im2=Image.open("c.png")

im2.filter(ImageFilter.EDGE\_ENHANCE)

im2.filter(ImageFilter.FIND\_EDGES).save("edge\_enhance.png")

2.4.py

#this file is used to fomat json file to csv file

#importcsv module

import csv

import json

#read the json file as dictionary

jsonfile=json.load(open("jsonfile.json",'r'))

#write jsonfile to csv file

with open("file2.csv",'w') as csvfile:

writer=csv.writer(csvfile)

for key,value in jsonfile.items():

writer.writerow([key,value])\

2.4\_1.py

#this file is used to format csv file to json

import json

import csv

#read csvfile

dic=[]

with open("file.csv",'r') as csvfile:

reader=csv.reader(csvfile)

dic=dict(reader)

#write data to json file

json.dump(dic,open("jsonfile.json",'w'))

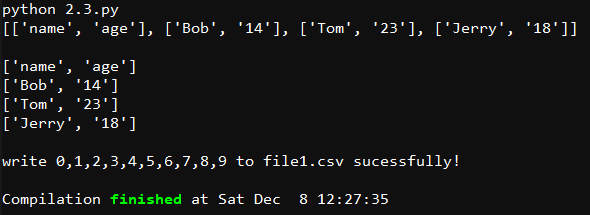
#verify the content of

print(json.load(open("jsonfile.json",'r')))

1. Output

2.1: see file data.txt

2.2: see file

2.3: see file

2.4: see file

1. Analysis and conclusions

This lab taught me how to write a program to handle picture and other data storage file using python. And I actually learned how to solve this problem and I will use these method in the progress of my study and work in later.