CMPT 120
Intro to CS & Programming I

WEEK 11 (Mar. 24-28)

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Lecture 27:
Writing to files

http://www.sfu.ca/~jlumbros/Courses/CMPT120/

A few questions for you… before a more detailed survey electronically

MINI-SURVEY
TO DETERMINE NEXT CLASSES

Preliminary Survey

Q1. How many exams do you have on week of April 7th (i.e., on Friday April 10th)?

A 1
B 2
C More
D None

Q2. How do you feel about the upcoming final?

A Confident
B So-so
C Stressed
D Scared
E Flipping Out

Q3. Which of these topics do you find hardest?

A For loops
B While loops
C Flag variables
D Strings
E Accumulation

Q4. Which of these topics do you find hardest?

A Lists
B Files
C Matrices
D Functions
E If statements

Q5. Which of type of question do you find hardest?

A Run code
B Understand
C Debug
D Write code
E Definition

Ms. Fonda Boise wants answers!!

WRAPPING UP TASK 2

Task 2: Catching Duplicates

```
Kenneth Badillo,Armand Britton,0.86,0.68,0.38,0.49,0.25
Kenneth Badillo,Octavio Bunting,0.85,0.56,0.36,0.34,0.34
Kenneth Badillo,Tracie Cade,0.76,0.56,0.22,0.45,0.33
```

- Read lines from `"file3.txt"`
- For each line
  - Strip off white space
  - Split according to the `","`
  - Convert 5 last entries with `float(...)` function
  - Consider that the similarity (`scoreS`) is **`max`** of the first two floats (i.e., `0.85,0.56`)
  - Consider that the dissimilarity (`scoreD`) is **`min`** of the next two floats (i.e., `0.22,0.45`)
  - Print line if `scoreS > 0.55` **and** `scoreD < 0.12`
- **Goal:** find how many cheaters (and who they are)

Task 2: Code

```
lines = open("file3.txt").readlines()

for line in lines:
  items = line.strip().split(",")
  scores = items[2:]
  for i in range(len(scores)):
    scores[i] = float(scores[i])
  scoreS = max(scores[0], scores[1])
  scoreD = min(scores[2], scores[3])
  if scoreS > 0.55 and scoreD < 0.12:
    print line
```

Whodunit?

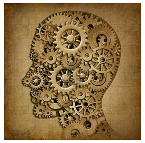
- What is printed out?

```
Norma Click, Therese Benner, 0.72, 0.73, 0.07, 0.07, 0.12
Norma Click, Will Everhart, 0.87, 0.92, 0.03, 0.04, 0.16
Therese Benner, Will Everhart, 0.69, 0.73, 0.1, 0.11, 0.18
Shirley Greer, Mohammad Aldridge, 1.0, 1.0, 0.0, 0.0, 9.99
Tony Carlos, Jacques Dumont, 0.67, 0.75, 0.0, 0.0, 0.0
```

- So there are 5 pairs of (presumed) cheaters, and 7 (presumed) cheaters
  - Norma Click, Therese Benner, Will Everhart
  - Shirley Greer, Mohammad Aldridge (identical)
  - Tony Carlos, Jacques Dumont

A NOTE ON WRITING

Writing a File



- In an Python shell, type

```
>>> import os
>>> os.getcwd()
/Users/jlumbroso/Documents
>>> f = open("testfile.txt", "w")
>>> f.write("Hello")
```

- Then open the file `"testfile.txt"`

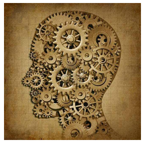
A Done

B No computer

My File Is Empty!

- Python works on files with a **buffer**
- Because actually writing to the disk takes some time, to go faster, and it does some operations in memory, and only once in a while writes them to the file
- To force Python to **actually** write to a file we need to
  - `f.flush()` “flushes” the buffer (it forces Python to write everything that is in the buffer to the file)
  - `f.close()` flushes the buffer and closes the file (but then we cannot read or write from it anymore)

Flush that Buffer!



- Close the file "testfile.txt"

  (in NotePad/TextEdit), then:

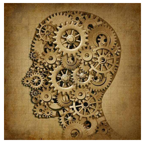
```
>>> import os
>>> os.getcwd()
/Users/jlumbroso/Documents
>>> f = open("testfile.txt", "w")
>>> f.write("Hello")
>>> f.flush()
```

- Open the file "`testfile.txt`" now

A Still empty!

B I'm good ☺

How Big is the Buffer?



- Experiment to see how big the buffer is – and if it depends on the computer

```
import os
print os.getcwd()
from time import sleep              # function to pause program
f = open("testfile2.txt", "w")
for i in range(10000):
  f.write(str(i) + "\n")     # str(…) to convert int to string
  sleep(0.01)
```

- Keep **closing** and **re-opening** the file `"testfile2.txt"` in your Notepad/TextEdit
- Initially it should be empty
- But at some point you will see a list of numbers appear (not all of them), so **iClicker numerical VOTE: what is the largest number do you see (scroll down to bottom of file)?**

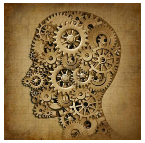
Grading Course Exercise 8

```python
import os

from os import listdir
from os.path import isdir, isfile, join

mypath = "."
students = listdir(mypath)

def prompt_student(student, total = 1.0):
  s = ""
  for file in listdir(join(mypath, student)):
    s = s + open(join(mypath,
                      student,file)).read()
    s = s +"\n"
  print "="*20
  print "STUDENT: %s" % student
  print "="*20
  print s
  print "="*20
```

```python
while True:
  grade = raw_input("[F]ull, [H]alf or [N]o" +
                   " marks? ").lower()
  if not (grade in "fhn"):
    continue
  if grade == "f":
    return 1.25
  if grade == "h":
    return 0.75
  if grade == "n":
    return 0.0

grade_file = open("grades.csv", "w")
grade_file.write("Userid, CE8\n")

for s in students:
  grade = prompt_student(s)
  grade_file.write("%s, %0.1f\n" % (s, grade))
  grade_file.flush()

grade_file.close()
```

- Display student work and ask for simple grade input
- Allowed me to grade 30 submissions in 2 minutes!

Try It Yourself



- Open a file "out.txt" to write to (what mode do you need to use?)
- Do an infinite loop **`while`** `True`
  - Ask the user for input using s = raw_input("…")
  - If s is equal to "q", then exit the loop using **break**
  - If not, write s to the file and flush the buffer
- Close the file

A Done

B Help!

C No computer

Mini-assignment 2

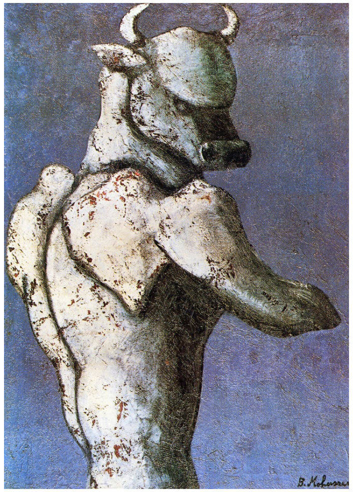
PREVIEW OF NEXT WEEK'S LAB

“Ariana”

- You have a maze stored in a file:

```
 ########
    #   #
### # # #
# #   # #
#M  ###
########
```

http://goo.gl/tXeot2

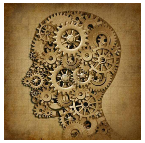


- You must determine if it is possible to go from the top left corner, to the bottom right corner without encountering the minotaur

What You Will Have to Do?

- Involves
  - reading a file line by line
  - converting it to a list of list (a matrix)
  - and then working on this list
  - writing the answer ("ALIVE", "STUCK", "DEAD") to a file
- Will recap most of what has been done in this course, and is a good way to study for final exam
- Detailed explanations available this week-end

Let's Start Together



Inputing the file

- Open a file `"maze.txt"`, a read all the lines
- Create an empty list `maze = [ ]`
- For each line
  - look at each character: if it is a `"   "` (space) add `0` to the list; if it is a `"#"` or a `"M"` add `-1` to the list
- `print maze`
- Find a way to write the maze to a file "new-maze.txt" (be careful, you will have to convert the integers to strings)

Test it either with the maze I gave, or create your own test file

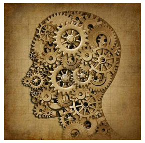
A Done

B Help!

C No computer

Pacing and Understanding

How well did you understand today?



- A Too easy, this lecture is way below my abilities
- B Everything went at a good pace, and I am fine
- C Too fast, but I will catch up on my own
- D Too fast, and I need you to slow down
- E I really do not think I can handle this