2807/7001ICT Programming Principles (I), Trimester 1, 2020
Workshop 7

School of Information and Communication Technology
Griffith University

April 12, 2020

Module	3
When	Week 7
Goals	This workshop focusses on everything in the course up to files.
Marks	5
Due	All work (pre-workshop questions and problems) due by electronic submission on Learning@Griffith, at end of day, Friday 24/04/2020.

1 Preparation

Before your workshop class:

- Read all of this document.
- Review the lecture notes sections 1 to 20.
- Bring some paper (a print-out of this document is best) and writing implements.
- Bring a storage device, such as a portable hard drive and cable, or a USB drive.

2 Electronic submission

Due to the COVID-19 situation we are moving to electronic submission of workshops. Please submit a zip (not rar or any other format) file containing folders with names "`questions`", "`problem1`", "`problem2`, ... Question answers must be labelled. Put your solution files for each problem in the correct folder. The folders may be the folders created as projects for PyCharm or other IDE.

3 Pre-workshop questions (1 mark)

Complete these questions in writing *before* the start of the workshop. They will be marked early in the workshop.

1. Give two differences between a tuple and a list.

2. Give an important difference between an array in an older language, such as C, and a list in Python.

3. Complete this table, if the following statements have already been executed. Try to work it out yourself, before confirming with the REPL.

```
i = 3
s = ’robin’
xs = [5, 4, 3, 2, 1]
t = (i, xs, s, False)
```

expression	*type*	*value*
`i`	`int`	`3`
`s[0]`		
`xs[2]`		
`xs[i]`		
`t[3]`		
`xs[-1]`		
`xs[-3]`		
`s[1:]`		
`s[1:3]`		
`s[1:-2]`		
`xs[:-1]`		
`xs[0::2]`		
`t[1][1]`		
`t[2][:-2]`		

4 Workshop activities

4.1 Marking last workshop’s problems

If you have problems that still need marking from the previous workshop, get them marked at the *start* of this one.

4.2 Problem 1 (1 mark)

Problem: The Unix tool `head` prints only the top few lines of a file. Write your own version of `head` that prompts for the name of the file to read, and the number of lines to print. For example:

```
File name: Lear.txt
Lines: 9
I
The Owl and the Pussy-cat went to sea
   In a beautiful pea-green boat,
They took some honey, and plenty of money,
   Wrapped up in a five-pound note.
The Owl looked up to the stars above,
   And sang to a small guitar,
"O lovely Pussy! O Pussy, my love,
    What a beautiful Pussy you are,
```

If the file has fewer lines than requested, print as many as there are.

Hint: You don't need to store all the lines in memory before printing them.

4.3 Problem 2 (1 mark)

Problem: The Unix tool `tail` prints only the bottom few lines of a file. Write your own version of `tail` that prompts for the name of the file to read, and the number of lines to print. For example:

```
File name: Lear.txt
Lines: 4
   They danced by the light of the moon,
             The moon,
             The moon,
They danced by the light of the moon.
```

If the file has fewer lines than requested, print as many as there are.

4.4 Problem 3 (1 mark)

Problem: Write a program that prompts for the name of a file containing numbers, one per line, and prints the average (arithmetic mean) and the median. For example:

```
File name: scores.txt
Average = 24.5
Median = 25.5
```

The Python standard library has a `statistics` module, with a `median` function. You are not permitted to use that module for this problem.

4.5 Problem 4 (1 mark)

Problem: The Unix tool `wc` counts the numbers of characters, words and lines in a file. Write your own version of `wc` that prompts for the name of the file to read, then prints the counts. For example:

```
File name: Lear.txt
Characters: 1242
Words: 224
Lines: 38
```

Hint: You don't need to store all the lines in memory before counting.

5 After the workshop

- You have created programs that might be useful to refer back to in future workshops. Make sure that you will have that work in the future. One copy is not enough for at IT professional. You should have at least 2 copies:

  1. on your Griffith network storage drive; and
  2. on your portable storage device.