

COMP10001 Foundations of Computing

Semester 1, 2019

Tutorial Questions: Week 9

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Discussion

1. Why do we use “files”? Could we use computers without them?
2. What are the steps to reading and writing files?
3. What is a “csv” file and why is it useful for storing and manipulating data?

Now try Exercises 1

4. What is a “list comprehension”? How do we write one and how do they make our code simpler?
5. What is a “defaultdict”? How do we initialise and use it?

Now try Exercises 2 & 3

Exercises

1. Fill in the blanks in the program below which reads from `in.txt` and writes to `out.txt`.

```
outfile =  ("out.txt", "w")
with open("in.txt", ) as infile:
    line_no = 1
    for line in :
        outfile. (f"line:_{line_no},_length:_{len(line)}\n")
        line_no += 1
outfile.write("The_End")

```

2. Evaluate the following list comprehensions. For each one, also write some python code to generate the same list without using a comprehension.

(a) `[(name, 0) for name in {"evelyn", "alex", "sam"}]`

(b) `[i**2 for i in range(5) if i % 2 == 1]`

(c) `"".join([letter.upper() for letter in "python"])`

3. Rewrite the following with a default dictionary

```
my_dict = {}
for i in range(20):
    if i % 3 in my_dict:
        my_dict[i % 3].append(i)
    else:
        my_dict[i % 3] = [i]
```

Problems

1. Write a function which takes a filename as a string and opens the file, printing statistics for every line in the file: the line number, amount of words, amount of characters. Remember to close the file when you're done!
2. Write a function which takes a string as input and returns a sorted list of the words which occur only once in the string. Try using a defaultdict and list comprehensions in your solution.