CSC 242: Introduction to Computer Science II

Assignment 1

Due Tuesday, April 7th at 11:59 pm

Reading

Review Chapters 1 - 6 and read Chapter 7 and sections 8.1 and 8.2 in **Introduction to Computing using Python: An Application Development Focus** by Ljubomir Perković.

Logistics

In this class programming assignments may be completed in consultation with up to two other classmates. You must identify the classmates with whom you collaborate in a comment at the top of the assignment, and the number of collaborators on any assignment **may not exceed two other people**. You must also submit a comment in your submission for each assignment that describes in detail how each collaborator contributed to the assignment. If you did not collaborate with anyone on the assignment, you must include a comment that says that. You may not under any circumstances discuss the assignments with classmates other than your identified collaborators. Working so closely with anyone other than your identified collaborators, or the Instructor, so as to produce identical or near identical code is a violation of the Academic Integrity policy. This policy will be strictly enforced.

Please include the following with your assignment submission:

1. A comment at the top of your Python file identifying any classmates with whom you discussed or in any other way collaborated on the assignment. You may work (directly or indirectly) with **no more than two** other people.
2. Add a comment at the top of your Python file that describes for each person what they contributed to the assignment. This must be at least 2-3 sentences and be **very specific and detailed**.

A submission that does not include a list of collaborators and a comment indicating how you collaborated with classmates will earn a 0. If you worked alone you must put a comment at the top of your file that indicates that or you will also receive a 0. There will be no exceptions to this rule.

Assignment

Note that the questions on this assignment are a review of material from the first-quarter Python class. If you do not find these questions to be straightforward you should spend part of your first week of the quarter reviewing material from CSC 241.

This is the only assignment where I will have short / answer or analysis questions. From here on out, they will all be purely programming assignments.

For parts 1 and 2, please upload a text file named csc242hw1.txt or a Word document named csc242hw1.docx.

For part 3, you must upload a py file as csc242hw1.py.

All the files can be uploaded into a zip file.

Part 1: Short Answer (30 Points): 10 points each. Be as detailed as possible.

IMPORTANT: Let's review some concepts from CSC 241 that we will be using quite a bit in CSC 242.

Question 1 (10 Points): Describe the similarities and differences between lists, dictionaries, sets and tuples. Which are mutable and which are immutable? Be as detailed as possible.

Question 2 (10 Points): Describe the similarities and differences between continue, break and pass when used in loops. Be as detailed as possible.

Question 3 (10 Points): What are exceptions? Why are they useful? Name a few different types of exceptions and give a general example of handling an exception.

Part 2: Code Analysis (20 Points)

IMPORTANT: In 242, some of the programs you write will be longer than in 241. When we get to recursion, your code will behave in a radically different way. It is important that you understand what the code is actually doing… there isn't any magic here. 😉 This problem will force you to really look at the code and process it as though you were the machine.

Question 4 (20 Points): Using the code below, with as much ***detail as possible***:
1. Describe, line by the line, the execution of this code. Every line must be described. – 10 points
2. The value of the variables at each step of the code, ***including the stacktrace*** with final output**.** – 5 points

Note: Every student will have different output.

You must use your own student ID (emplid) number as the string (may start with 0 and it needs to be included). You will find your student ID on your id card. If you don't know it, email me asap.

```
import random
def getValue(maxVal):
    a = maxVal *2
    return random.randrange(0,a) #make sure to describe the behavior of this line in detail!

def func(val):
    output = set()
    for i in val:
        print(i)
        num = int(i)
        if num > 0:
            rndnum = getValue(num)
            output.add(rndnum)
    return output

val=input('Please enter your 7 digit student id:')
print(func(val))
```

Part 3: Coding (50 Points)

IMPORTANT: You will be writing a lot of code in 242… lets get warmed up with some problems from 241. Many of my assignments and exams will involve accessing and writing files so it is important that you revisit those concepts.

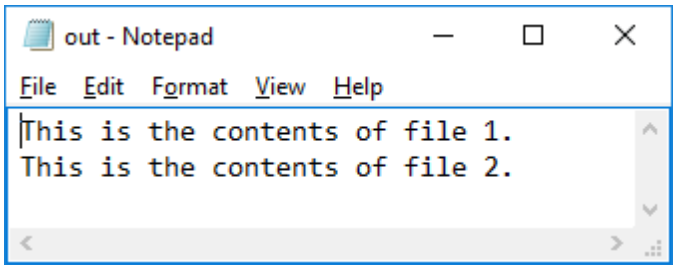
Implement the functions below in a file called **csc242hw1.py** a template for which has been provided on the D2L site. **You must include appropriate doc strings** (e.g. strings that appear on the line following the class or function header -- ask if you don't know what I mean) to the functions that clearly and concisely describe what the functions are doing. A submission without doc strings will not earn full credit.

Question 5 (25 points): Write a function named numVowelsInFile() that takes a filename and **prints** the number of vowels (regardless of case) that appear in the file. As a reminder, a vowel is one of a, e, i, o, or u. **File errors need to be caught** (FileNotFoundError, IOError etc)**.**

```
>>> numVowelsInFile('Sample1.txt')
a found: 2
e found: 5
i found: 7
o found: 2
u found: 1
>>> numVowelsInFile('Sample2.txt')
a found: 39
e found: 35
i found: 30
o found: 35
u found: 23
```

Question 6 (25 points):

Write a function named **mergeFiles()**. Takes in 3 inputs, the path to two source files and a path to a new file. The function takes the content of the first and second file and merges them into the 3rd file. All exceptions must be caught (FileNotFoundError, IOError etc). Result is the file written with the contents of the two other files:




```
>>> mergeFiles('1.txt','2.txt','out.txt')
>>> mergeFiles('A.txt','2.txt','out.txt')
One of the two files could not be found
>>>
```

Submitting the assignment

You must submit the assignment using the assignment 1 dropbox on the D2L site. Submit a Python file (csc242hw1.zip) with your short answers in a text file and your two coding solutions in a .py file. implementation in it and comments describing your collaboration status. Submissions after the deadline listed above will be automatically rejected by the system. See the syllabus for the grading policy.

Grading

The assignment is worth 100 points. Any student who does not submit comments in the Python file describing the contributions of each team member or indicating that he/she worked alone will earn a 0 on the assignment.