

CSc11300 Programming Languages Lab Assignment - 2

April 6, 2021

Instructor: Ahmet C. Yuksel

Deadline: 04/08 11:59 pm

Use Python3 to solve the programming problems, make a single .py file to send it to the instructor to Zoom directly. After you create your functions make sure to call them with some sample arguments whenever it is necessary. You may NOT use anything we have not learned yet. Submit your text files for the necessary questions.

1. (15 points) In number theory, a perfect number is a positive integer that is equal to the sum of its proper positive divisors, that is, the sum of its positive divisors excluding itself (also known as its aliquot sum). In other words, a perfect number is a number that is half of the sum of all its positive divisors (including itself). Write a Python3 program to check if a user-entered number is a perfect number or not. Use exception handling to catch and handle invalid inputs. Your program needs to run until the user decides to quit.
2. (15 points) Write a Python3 program to find all prime numbers between 2 integer numbers (both inclusive) entered by the user. Print all the prime numbers in between both on screen and to an output file named 'primes.txt' that needs to be created with a compound statement of Python3.
3. (15 points) Write a Python3 program to check if 3 user entered points on the coordinate plane creates a triangle or not. Your program needs to repeat until the user decides to quit, and needs to deal with invalid inputs.

4. (15 points) Open the file (quotes.txt) given below using Python3. Design a function to get the file object as a parameter, and get rid of every extra new line and save the result in a new file named quotes2.txt. In file quotes2.txt, there has to be only a single new line character after each name.

The image shows two side-by-side screenshots of a text editor window. The left window, titled 'quotes.txt — Edited', displays a file with several lines of text, each followed by multiple blank lines. The right window, titled 'quotes2.txt — Edited', shows the same text but with only a single blank line between each line of text, indicating that the extra newlines have been removed.

```
quotes.txt — Edited
"Never attempt to win by force what can be won by
deception"— Niccolo Machiavelli, The Prince.

"To know your Enemy, you must become your
Enemy"— Sun Tzu, The Art of War.

"Never was anything great achieved without
danger"— Niccolò Machiavelli, The Prince.

"It is much safer to be feared than loved because
love is preserved by the link of obligation which,
owing to the baseness of men, is broken at every
opportunity for their advantage; but fear
preserves you by a dread of punishment which never
fails"— Niccolo Machiavelli, The Prince.

"America has no permanent friends or enemies, only
interests"— Henry Kissinger.

"Everybody is a genius. But if you judge a fish by
its ability to climb a tree, it will live its
whole life believing that it is stupid" — Albert
Einstein.

quotes2.txt — Edited
"Never attempt to win by force what can be won by
deception"— Niccolo Machiavelli, The Prince.
"To know your Enemy, you must become your
Enemy"— Sun Tzu, The Art of War.
"Never was anything great achieved without
danger"— Niccolò Machiavelli, The Prince.
"It is much safer to be feared than loved because
love is preserved by the link of obligation which,
owing to the baseness of men, is broken at every
opportunity for their advantage; but fear
preserves you by a dread of punishment which never
fails"— Niccolo Machiavelli, The Prince.
"America has no permanent friends or enemies, only
interests"— Henry Kissinger.
"Everybody is a genius. But if you judge a fish by
its ability to climb a tree, it will live its
whole life believing that it is stupid" — Albert
Einstein.
```

5. (15 points) Design a Python3 function that takes in a file object as its parameter, read the contents of the file by using read() method only, if the number of lines is a prime number, clear all the new line characters. And write it back to the same file. If the number of lines is not a prime number then, remove the new line character and a tab space instead and write it back to the same file.
6. (15 points) Write a Python3 function that works with any string A of length greater than user-defined k , and prints the string then trims one character from the end of the string at a time and prints it again until there are k characters are left. A sample output is given below when $A='Greetings'$ and $k = 3$:

```
Greetings
Greeting
Greetin
Greeti
Greet
Gree
Gre _
```