COMP248 A3 W2022 - ASSIGNMENT 3

Object-Oriented Programming I (Concordia University)

Concordia University
Computer Science & Software Engineering
Faculty of Engineering and Computer Science

Concordia University
COMP 248 – W2022
Assignment 3

Due Date:	By 11:59 PM, March 11th, 2022
Evaluation:	5% of final mark (see marking rubric at the end of handout)
Late Submission:	none accepted
Purpose:	The purpose of this assignment is to have you manipulate loops and 1 and 2-dimensional arrays of strings
CEAB/CIPS ATTRIBUTES:	Design/Problem analysis/Communication Skills

Please note: *you are NOT allowed to post the assignment/solution anywhere on the Internet. Intellectual Property rights are reserved. If any similar cases are found via your account or IP, your submission will NOT be considered and will be reported immediately.*

General Guidelines When Writing Programs:

Refer to assignment#2 handout.

Question 1: Sentence Scan Program

Write a program to read a sentence and display the length of each word, the number of words in the sentence, the length of the shortest and longest words and the average length of the words. Here is an example of how your program should behave (assume that the data in green has been entered by the user).

```
-------****-------****-------****-------****-------
Welcome To The SENTENCE SCAN PROGRAM!
-------****-------****-------****-------****-------
Please enter the sentence to scan:
My Quiz2 was graded.


Here are some data about your sentence:

Word 1 has 2 characters.
Word 2 has 5 characters.
Word 3 has 3 characters.
Word 4 has 6 characters.


There are 4 words.
The longest word has 6 characters.
The shortest word has 2 characters.
The average word length is 4.0 characters.

Thank you for using The SENTENCE SCAN PROGRAM!
```

Figure 1 Sample output of Question1

```
-------****-------****-------****-------****-------
Welcome To The SENTENCE SCAN PROGRAM!
-------****-------****-------****-------****-------
Please enter the sentence to scan:
COVID-19 it's not over!

Here are some data about your sentence:

Word 1 has 8 characters.
Word 2 has 4 characters.
Word 3 has 3 characters.
Word 4 has 4 characters.


There are 4 words.
The longest word has 8 characters.
The shortest word has 3 characters.
The average word length is 4.75 characters.

Thank you for using The SENTENCE SCAN PROGRAM!
```

Figure 2 Sample output of Question1

Notes:

- You can assume that a sentence will always fit within a line: so, you can used `nextLine()` to read the sentence.
- A sentence will always finish with a punctuation mark (e.g., a period, a question mark, ...) which should not be considered as part of the last word.
- A word is any sequence of non-white characters. For example, *`I'll`* is 1 word, but *`I will`* is considered 2 words.
- You can assume that the words will always be followed by 1 and only 1 white space (except for the last word which is followed by punctuation)

Question 2: Student Grades Report Program

In this question, we will write a complete Java program to prompt the student for a sequence of courses with its grade in the format of "*Course1|Grade1;Course2|Grade2;Course3|Grade3;*" as one string. Your program should separate the string into the course name and grade individually and save the course names and grades in two different arrays (2D-character array for course names and integer array for grade) and display the list of courses, average of the grades as a numerical value and letter accordingly.

You can expect a perfect user who will enter the correct format. Your program should work for any numbers of course that were entered.

Note: The table below depicts the numerical grades and their corresponding letter grade.

Letter grade	Numerical value
A	≥88
B	≥ 80
C	≥ 67
D	≥ 60
F	< 60

For example

If the user's input is *"COMP248|95,ENGLISH201|75,CHEMISTRY-1|45,"*, then the info saved in the 2D-character array is:

C	O	M	P	2	4	8				
E	N	G	L	I	S	H	2	0	1	
C	H	E	M	I	S	T	R	Y	-	1

the info saved in the integer array is:

95	75	45

your program should display *"Here is the list of courses you are taking:*

No.1 COMP248

No.2 ENGLISH201

No.3 CHEMISTRY-1

The average of your courses: 71.67 and the average courses letter grade is: C

(Note: your program should read the output data from the arrays).

Hint: you can use *Integer.parseInt()* to convert a string to an integer number and *toCharArray()* to convert a string to a character array.

The following are sample screen shots to illustrate the expected behavior of your program. Your program must display the same information with the same format. (assume that the data in green has been entered by the user).

```
-------****-------****-------****-------****-------
        Welcome to Student Courses Grade Program!
-------****-------****-------****-------****-------
Please enter the courses your are taking this semester (course|grade and separated by a semicolon):
0

You are not taking any course now!

Thank you for using Student Courses Grade Program!
```

Figure 1 Sample output of Question2

```
-------****-------****-------****-------****-------
        Welcome to Student Courses Grade Program!
-------****-------****-------****-------****-------
Please enter the courses your are taking this semester (course|grade and separated by a semicolon):
MATH101|40;STAT-102|20;LANG304|85;

Here is the list of courses you are taking:

No.1 MATH101
No.2 STAT-102
No.3 LANG304
The average of your courses: 48.33 and the average courses letter grade is: F

Thank you for using Student Courses Grade Program!
```

Figure 2 Sample output of Question2

```
-------****-------****-------****-------****-------
        Welcome to Student Courses Grade Program!
-------****-------****-------****-------****-------
Please enter the courses your are taking this semester (course|grade and separated by a semicolon):
comp248|88;STAT202|92;COMP101|96;ENGG-203|95;

Here is the list of courses you are taking:

No.1 comp248
No.2 STAT202
No.3 COMP101
No.4 ENGG-203
The average of your courses: 92.75 and the average courses letter grade is: A

Thank you for using Student Courses Grade Program!
```

Figure 3 Sample output of Question2

Submitting Assignment 3

What to submit:

Zip the source codes (the .java files only please, **not** the entire project) of this assignment as a .ZIP file (**NOT** .RAR) using the following naming convention: *a#_studentID*, where # is the number of the assignment and *studentID* is your student ID number. For example, for this third assignment, student 123456 would submit a zip file named a3_123456.zip

How to submit:

Submit from Moodle course page. If you are in an eConcordia course, please check your eConcordia webpage for instructions on how to submit your assignment.

Evaluation Criteria for Assignment 3 (20 points)

Source Code	
Comments for all 2 questions (1.5 pts.)	
Description of the program (authors, date, purpose)	0.5 pts.
Description of variables and constants	0.5 pts.
Description of the algorithm	0.5 pts.
Programming Style for all 2 questions (1.5 pts.)	
Use of significant names for identifiers	0.5 pts.
Indentation and readability	0.5 pts.
Welcome Banner or message/Closing message	0.5 pts.
Question 1 (8 pts.)	
Prompt for a list of words in a sentence	1.5 pts.
Display the correct length of each word	2.0 pts.
Use of correct formula for long, short, average	2.5 pts
Display the correct result	2 pts.
Question 2 (9 pts.)	
Prompt for the course' info	1.0 pt.
Create and fill the 2D-array	2.5 pts.
Create and fill the 1D -array	2.5 pts.
Display content of the course list	2.0 pts.
Display the result of courses average numerical and letter grade	1.0 pt.
TOTAL	**20 pts.**