CSCI 1700 Programming Assignment # 5(100 pts)

**Due Date: 12/8/2015**

1. (15 pts) Chap 9 #4

**A Sample dialogue**:

--------------------Configuration: <Default>--------------------

Enter a numerator:

10

Enter a denominator:

0

The denominator should not be set to zero.

Enter 'Y' to go again, anything else to exit.

Y

Enter a numerator:

10

Enter a denominator:

2

The fraction reduced is 5 / 1

Enter 'Y' to go again, anything else to exit.

Y

Enter a numerator:

15

Enter a denominator:

hello

You must enter an integer. Try again.

Enter 'Y' to go again, anything else to exit.

Y

Enter a numerator:

15

Enter a denominator:

3.5

You must enter an integer. Try again.

Enter 'Y' to go again, anything else to exit.

15

Process completed.

1. (15 pts) Chap 9 #7

a sample **dialogue**:

--------------------Configuration: <Default>--------------------

Do you want to open an account, deposit, or withdraw?

Enter O for open an account, D for deposit, W for withdraw:

o

Enter the initial deposit for your new account:

100

Your account balance: 100.0

More banking? answer Y to continue, N to exit

y

Do you want to open an account, deposit, or withdraw?

Enter O for open an account, D for deposit, W for withdraw:

d

Enter the amount to deposit:

-2

NonPositiveNumberException: Deposit amount must be positive.

Enter a positive number:

20

Your account balance: 120.0

More banking? answer Y to continue, N to exit

y

Do you want to open an account, deposit, or withdraw?

Enter O for open an account, D for deposit, W for withdraw:

w

Enter the amount to withdraw:

150

Not enough money.

InsufficientFundsException: Insufficient funds to withdraw this amount.

Your account balance: 120.0

More banking? answer Y to continue, N to exit

y

Do you want to open an account, deposit, or withdraw?

Enter O for open an account, D for deposit, W for withdraw:

w

Enter the amount to withdraw:

100

Your account balance: 20.0

More banking? answer Y to continue, N to exit

y

Do you want to open an account, deposit, or withdraw?

Enter O for open an account, D for deposit, W for withdraw:

e

Invalid selection!

More banking? answer Y to continue, N to exit

n

Process completed.

1. (30 pts) Write a Java program that will repeatedly perform the following text file analysis tasks.

* It will count the number of words in the open text file and display this count along with the average word length (average number of characters per word), the total number of word characters, the total number of punctuation characters, the length of the shortest word, and the length of the longest word.
* It will list all of the shortest words found in the text file.
* It will list all of the longest words found in the text file.
* It will search for a word specified by the user and report how many times the word occurs in the text file.

The program will display all of the results on the screen as well as writing the results to the output text file. The main method of your program should first ask the user for the name of the output file and open the file for writing. Then it will prompt user to enter a input text file name to read from. It should repeatedly offer the user a menu of the above tasks. Each of the above tasks should be implemented in your program as separate methods.

**Note:** A word is defined to be a string of symbols that is preceded and followed by whitespace or the beginning of the line or the end of the line, or a portion of such a string. If such a string begins and ends with non-punctuation characters, then the string is a word. If such a string begins or ends with punctuation characters, the word embedded in the string will be the string with preceding and ending punctuation characters removed. In either case, punctuation characters in the middle of the string should not be removed and should be considered part of the word. So, the punctuation count should include those punctuation characters before or after a word, but not include punctuation characters embedded in a word.

**Notes:** 1).The length of a word followed by a punctuation character does not include the punctuation character.

**2). You should write a private method to handle the opening of the input text file, since you will need to open the input text file multiple times when performing the above tasks.**

3). You can copy two text files ([S:\Coursework\Liu\CSCI1700\story.txt](file:///S:\Coursework\Liu\story.txt) and [S:\Coursework\Liu\\CSCI1700\story2.txt](file:///S:\Coursework\Liu\story2.txt)) to test your program.

4). The program will first prompt the user to enter an output file name, you can enter a file name of your choice, with a file ending .txt. When you are prompted to enter the input file name, you can enter story.txt or story2.txt.

a sample **dialogue** when using story.txt as the input file:

--------------------Configuration: <Default>--------------------

Enter output file name:

storyOut.txt

Enter input file name:

story.txt

Filename entered: story.txt

Select an option:

1 - Determine word statistics

2 - List shortest words

3 - List longest words

4 - Search for a word

5 - Exit

1

Filename: story.txt

Total number of words = 179

Average word length = 4.916201 characters.

Total number of word characters = 880

Total number of punctuation characters = 26

Shortest word length = 1

Longest word length = 13

Select an option:

1 - Determine word statistics

2 - List shortest words

3 - List longest words

4 - Search for a word

5 - Exit

2

Filename: story.txt

Shortest words in file:

a

a

a

I

a

a

a

a

a

Select an option:

1 - Determine word statistics

2 - List shortest words

3 - List longest words

4 - Search for a word

5 - Exit

3

Filename: story.txt

Longest words in file:

disappointing

participation

Massachusetts

Select an option:

1 - Determine word statistics

2 - List shortest words

3 - List longest words

4 - Search for a word

5 - Exit

4

Filename: story.txt

Enter word to find in file:

disappointing

Search word: disappointing

This word appears 1 time(s) in the file

Select an option:

1 - Determine word statistics

2 - List shortest words

3 - List longest words

4 - Search for a word

5 - Exit

4

Filename: story.txt

Enter word to find in file:

hello

Search word: hello

This word appears 0 time(s) in the file

Select an option:

1 - Determine word statistics

2 - List shortest words

3 - List longest words

4 - Search for a word

5 - Exit

5

Process completed.

1. (15 pts) Chap 10 #5

A sample **dialogue:**

--------------------Configuration: <Default>--------------------

Enter filename of file to remove blanks:

test.txt

Text file test.txt's content before removing extra blanks:

This is a test file with a lot of extra blanks.

We will remove those extra blanks by this simple program.

Text file test.txt's content after removing extra blanks:

This is a test file with a lot of extra blanks.

We will remove those extra blanks by this simple program.

Process completed.

1. (10 pts) The Fibonacci sequence is 0, 1, 1, 2, 3, 5, 8, 13, 21, … where the first two terms are 0 and 1, and each term thereafter is the sum of the two preceding terms. Write a Java program that repeatedly prompts for and reads a positive value *n*, calls a **recursive** method fibonacci to calculate the *n*th number in the Fibonacci sequence, and then displays the number. For example, if *n* = 9, then the program would display 21.

A sample **dialogue** (user input in **bold**):

Fibonacci number generator

Which one do you want (negative to exit)? **4**

The 4th Fibonacci number is 2

Which one do you want (negative to exit)? **5**

The 5th Fibonacci number is 3

Which one do you want (negative to exit)? **6**

The 6th Fibonacci number is 5

Which one do you want (negative to exit)? **7**

The 7th Fibonacci number is 8

Which one do you want (negative to exit)? **-1**

1. (15 pts) Chap 11 #9

**A sample dialogue** from the program:

--------------------Configuration: <Default>--------------------

Enter the directory / folder to search:

S:\\coursework\\Liu

Enter the file to search:

story.txt

The file: story.txt has been found in the following folder:

S:\coursework\Liu\CSCI1700\story.txt

The file: story.txt has been found in the following folder:

S:\coursework\Liu\CSCI1730\story.txt

End of search.

Another search? Type y to continue, n to exit:

y

Enter the directory / folder to search:

S:\\coursework\\Liu

Enter the file to search:

story.html

End of search.

Another search? Type y to continue, n to exit:

y

Enter the directory / folder to search:

H:\\CSCI1700

Enter the file to search:

FirstProgram.java

The file: FirstProgram.java has been found in the following folder:

H:\CSCI1700\5Edition\SourceCode\ch01\FirstProgram.java

The file: FirstProgram.java has been found in the following folder:

H:\CSCI1700\FirstProgram.java

The file: FirstProgram.java has been found in the following folder:

H:\CSCI1700\sourceCode\Source\_Code\_4e\ch01\FirstProgram.java

End of search.

Another search? Type y to continue, n to exit:

n

Process completed.

**What you need to turn in:**

1. **Source code listing:** A printed copy of the source code for each problem. Remember to include your name in a comment at the top of your source code. Be sure to follow the “Code Style Guidelines” specified in class.
2. **Source code files:** E-mail me a copy of your source code. Send individual.java files as attachments.
3. **Working in Pairs:** If you want to work with one other student in our class on this assignment, this is acceptable provided that both members of the pair make a contribution to the solution. If you decide to work in a pair, turn in only one copy of the solution – clearly identify the name of each pair member on everything that you turn in.
4. **Late Assignments:** Please note this information given in the “Assignment Information and Guidelines” handout regarding assignments that are turned in late:

“Assignments are due by the end of the day on the specified due date (both the paper copies and the e-mail copies). If you wish to turn in the paper copy of an assignment after class, place them under my office door. **Assignments turned in late will be assessed a 20% penalty per class day late.”**