Homework #02

데이터사이언스를 위한 컴퓨팅 1 (2022년도 2학기, M3239.005500)

Due: 2022년 10월 7일 (금) 23시 59분

1 Word Counter [60pts]

Implement a WordCounter class which counts the number of word and characters from a text. The class should provide interfaces to count word (`GetWordCount`), character (`GetCharacterCount`) and the number of unique words (`GetUniqueWordCount`). In addition, it can count a particular word (`GetWordCount_OneWord`).

Instruction:

1. Treat upper and lower characters as different characters (so "He" and "he" are different word).
2. Do not include comma (,) and period (.) as characters.
3. Use `std::string` to store text.
4. The class can have the following member variable:
   a. `std::string text`
5. The class can have the following member functions:
   a. `InputText(std::string)`
   b. `int GetWordCount()`
   c. `int GetCharacterCount()`
   d. `int GetUniqueWordCount()`
   e. `int GetWordCount_OneWord(const char *)`
      - Count how many times the word appears in the text.

Implementation:

Add all code related to class definition to `WordCounter.h` and all implementation to `WordCounter.cpp`. `main.cpp` have a test code.

`Makefile` is provided to help compilation and job scheduling. Please compile and run it at GSDS server. You can run test code by running "`make test`". Below is the results.

```
cfdsta@login0:~/HW2/WordCounter$ make test
g++    -c -o main.o main.cpp
g++ -o WordCounter main.o WordCounter.o
salloc --nodes=1 --ntasks-per-node=1 --time=5 --cpus-per-task=1 --mem=1G ./WordCounter
salloc: Granted job allocation 3456
Word Count: 36
Character Count: 152
Number of Unique Words: 33
The word and appears 2 times
salloc: Relinquishing job allocation 3456
```

2 Prime Number [40pts]

Please write a C++ code to print all prime numbers (소수) between two integer numbers given by users. For example:

```
cfdsta@login0:~/HW2/Prime$ make test
salloc --nodes=1 --ntasks-per-node=1 --time=5 --cpus-per-task=1 --mem=1G ./Prime
salloc: Granted job allocation 3471
Find prime number within a range:
-------------------------------------
-> The start of the range: 1
-> The end of the range: 100
The prime numbers between 1 and 100 are:
2 3 5 7 11 13 17 19 23 29 31 37 41 43 47 53 59 61 67 71 73 79 83 89 97
salloc: Relinquishing job allocation 3471
```

Instruction:

1. Use `for` loop.
2. To check whether the number is prime number, you can use %, modulo operator.
3. Get the number from user using `std::cin`.
4. Include two input numbers to check prime number.
5. 1 is not a prime number.
6. Modify `main.cpp` file provided and submit.

3 Submission Instruction

- Compress WordCounter directory and and Prime directory as a single file and report it to ETL.
- In `WordCounter` directory, you cannot change `main.cpp` and `Makefile`. You don't need to submit them.
- In `Prime` directory, you cannot change `Makefile`. You don't need to submit them.
- The file name you submit should be `YOUR_ACCOUNT_HW02.zip`. (ex: `cfds123_HW02.zip`)
- **Make sure your code works well on the GSDS server.** Your code will be scored automatically by the program on the GSDS server. If you don't follow the submission instruction, a penalty may occur.
- If you want to use your grace day, you must notify the TA by e-mail (`kisung.nam@snu.ac.kr`) when submitting the homework. If you don't notify, we will judge that you want to save your grace day for the next homeworks, so your homework is considered unsubmitted. Even if you use your grace day, your homework should be submitted through ETL.