Assignment 2

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Outline

- Deadline
- No Plagiarism
- Leave Comments
- Scoring
- Problem 1
- Problem 2
- Submission
- Questions

Deadline

- Sunday, November 19th 23:55 (LearnUs server time)
- No late submissions at all

No Plagiarism

- No Mercy.

- The punishment will be made to both
  - the person who copied the code, and the person who shared the code.

- We will do plagiarism test with codes that were made in previous semesters and also in google. So be careful ☺

Leave Comments

- Leave comments in your file for TAs to understand your code.
- If no comments in the file, there may be a reduction of points.

Scoring

- You should take care of your code not terminating by an issue in the middle of the loop
  - Scores will be given only by the final outputted file

- Example
  - 5 test cases
  - If your code is correct as O X O O O if ran seperately

  but terminates in the second test case by an error

  only the first test case is considered correct

- **Problem1 (50%)** **Problem2 (50%)**
- **Total of 100 points**

- If your code outputs correctly for given example input#.txt file
  - 15 base score per problem
- There will be additional 20 test cases
  - (35 / 20) = 1.75 per each case

Problem 1

- Calculate “Collatz Conjecture” algorithm and print its process
  - https://en.wikipedia.org/wiki/Collatz_conjecture
  - https://www.youtube.com/watch?v=094y1Z2wpJg

- For any positive integer N, result of function T(N) is
  - If N is even, divide it by two.
  - If N is odd, triple it and add one.

$$T(n) = \begin{cases} \dfrac{n}{2}, & \text{if } n \text{ is even} \\ 3n+1, & \text{if } n \text{ is odd} \end{cases}$$

- The Collatz conjecture is that if you apply the function T repeatedly, beginning with any positive number, the result will eventually become 1.

Problem 1

Input

- First row of input is number of loops : C $(0 \leq C < 100)$
- Subsequent rows indicate the first input N for function T $(1 \leq N < 10000)$

```
jinyoung@LAPTOP-25P5Q8UJ:~/Yonsei/Assignment2$ cat input1.txt
2
10
5
```

Output

- Print the process of the calculation.
- For example, 10 will become 10 -> 5 -> 16 -> 8 -> 4 -> 2 -> 1and 5 will become 5 -> 16 -> 8 -> 4 -> 2 -> 1
- output1.txt should be created if ran the code

```
jinyoung@LAPTOP-25P5Q8UJ:~/Yonsei/Assignment2$ cat output1.txt
10
5
16
8
4
2
1
5
16
8
4
2
1
```

Compile & Execute code

```
$ g++ -Wall problem1.cpp -o problem1
$ ./problem1
$ diff answer1.txt output1.txt
```

Problem 2

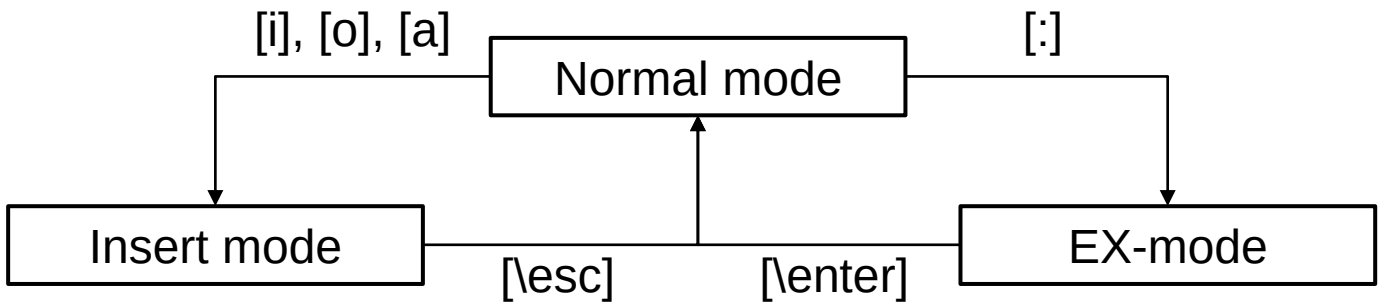
- Implement **Mini-Vim** that works on given commands.

- Like real **Vim**, Mini-Vim also has three different modes: Normal, Insert, and EX-mode.
- Using specific commands, users can switch modes and interact with Mini-Vim.

- The commands will be given without white space.
- Only one command per line.
  - So the “iabc” command does not indicate the “i” command + “abc” command.
- The upper and lower cases are distinguished.

Problem 2

- **Normal mode (**Initial State**)**
  - If Command “i” or “o” or “a” is entered, switch to “**Insert mode**”.
  - If Command “:” is entered, switch to “**EX-mode**”.
  - In other cases, just ignore it.
- **Insert mode**
  - If Command “\esc” is enterd, switch to “**Normal mode**”.
  - If other cases, just write them into file.
- **EX-mode**
  - If Command “\enter” is entered, switch to “**Normal mode**”.
  - If Command “w” is entered, save the file into disk. (save the file as “output2.txt”)
  - If Command “q” is entered, don’t save the file and return to the last saved state.
  - In other cases, just ignore it.



Problem 2

Input

- First row of input is number of loops : C $(0 \leq C < 100)$
- Subsequent rows indicate the Commands

Output

- Print the final content of the file.
- output2.txt should be created if ran the code

```
jinyoung@LAPTOP-25P5Q8UJ:~/Yonsei/Assignment2$ cat input2.txt
19
i
HelloWorld!
\esc
iabc
:
w
\enter
i
GoodMorning!
\esc
:
q
\enter
i
NiceToMeetYou!
\esc
:
w
\enter
```

```
jinyoung@LAPTOP-25P5Q8UJ:~/Yonsei/Assignment2$ cat output2.txt
HelloWorld!NiceToMeetYou!
```

Compile & Execute code

```
$ g++ -Wall problem2.cpp -o problem2
$ ./problem2
$ diff answer2.txt output2.txt
```

Submission

- Zip the folder by following steps correctly

```
jinyoung@LAPTOP-25P5Q8UJ:~/Yonsei/hw2_2016025314$ ls
problem1.cpp  problem2.cpp
jinyoung@LAPTOP-25P5Q8UJ:~/Yonsei/hw2_2016025314$ cd ..
jinyoung@LAPTOP-25P5Q8UJ:~/Yonsei$ tar -zcvf hw2_2016025314.tar.gz hw2_2016025314/
hw2_2016025314/
hw2_2016025314/problem2.cpp
hw2_2016025314/problem1.cpp
```

- hw2_studentId.tar.gz
  - Ex) hw2_2016025314.tar.gz

- There is going to be reduction of points if not following the folder hierarchy as well
- If unzipped your submission .tar.gz file should follow the folder hierarchy below

Current directory

- hw2_studentId.tar.gz
- hw2_studentId
  - problem1.cpp
  - problem2.cpp

Questions

- Recommendation: Classum in LearnUs
- You can also ask to TA: jinyoungkim97@yonsei.ac.kr

- We are not going to answer
  - Questions not making sense
  - Questions related to the algorithm for solving the question
  - Questions you can infer the answer if read this file thoroughly
  - Questions you can simply solve by googling
    - Ex) how do I make a folder on ubuntu?

Appendix

- File I/O

```
#include <fstream>
ofstream outfile;
outfile << "Hello, World!\n"; // writing Hello,World! into the file

outfile.close(); // should close the file before terminating the process

ifstream infile("input.txt");
infile >> number; // reading the first digit written in input.txt

infile.close(); // should close the file before terminating the process
```

https://stackoverflow.com/questions/7868936/read-file-line-by-line-using-ifstream-in-c

Appendix

- Zipping and unzipping the folder by tar command
  - https://linuxize.com/post/how-to-extract-unzip-tar-gz-file/
  - https://www.cyberciti.biz/faq/how-do-i-compress-a-whole-linux-or-unix-directory/