

## HW 4: Line Editor

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Assigned: October 7, 2019

**Due: 11:59pm October 14, 2019**

- The goal of this assignment is to make a simple line editor that has **command mode** and **insert mode** like the VI editor. For this assignment, modify the “rotate.c” program so that it has above two modes (command and insert) and changes the attribute of the terminal connection by itself. When the program starts, it turns off the canonical mode and the echo mode of the terminal.
  - **In the command mode,**
    - The line editor reads one key you press and immediately performs a particular action associated to the key (without pressing the “Enter” key).
    - If echo mode of the terminal is off, any characters should not be shown on the screen.
  - **In the insert mode,**
    - When you press a key, the line editor immediately prints out a character associated to the key (without pressing the “Enter” key).
    - Pressing ‘Esc’ key immediately switches the mode from the insert mode to the command mode (without pressing the “Enter” key).
  - **Key strokes and their actions**

Mode	Keystrokes	Action
Command mode	i	Switches to insert mode
	1	Turn on echo mode of the terminal
	2	Turn off echo mode of the terminal
	q	Quit. Restore the terminal mode before termination
Insert mode	Esc	Switches to insert mode
	Other keys	Print out a character on the screen. The remapped character should be printed out (See the remapping part in “rotate.c”).

- **Program logic**

- You can implement the program with the following logic or your own logic.

```
Start
Save the current terminal mode
Turn off canonical mode and echo mode of the terminal
while true
do
    read a key pressed

    if the editor mode is command mode
    then
        if "i" key is pressed
        then
            switch the editor mode to insert mode
        else if "l" key is pressed
        then
            turn on the echo mode of the terminal
        else if "2" key is pressed
        then
            turn off the echo mode of the terminal
        else if "q" key is pressed
        then
            Restore the terminal mode
            Quit program
        fi
    else if the editor mode is insert mode
    then
        if "Esc" key is pressed //key code of "Esc" key is 27
        then
            switch the editor mode to command mode
        else
        then
            remap the pressed key to a character //see the remapping part in "rotate.c"
            print out the remapped character to the screen
        fi
    fi
done
```

- **Remapping part in "rotate.c"**

```
if(c == 'z'){
    c = 'a';
}
else if (islower(c)){
    c++;
}
```

[How to execute it]

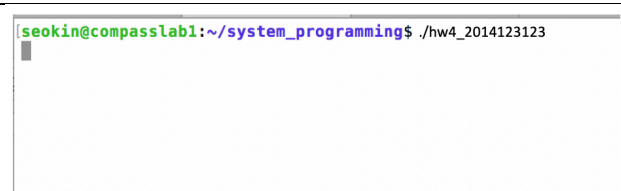
**\$ ./hw4\_2014123123**

[We will test your program with the following sequence]

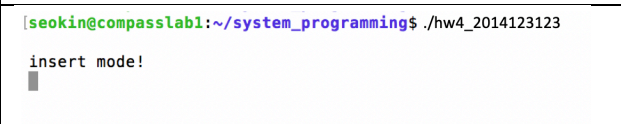
**\$ gcc hw4\_2014123123.c -o hw4\_2014123123**

**\$ ./hw4\_2014123123**

### //Type text in the command mode

Keystroke	Screen	Description
abcd		The editor prints out nothing because the echo mode is off.

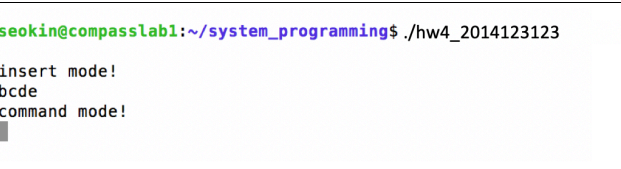
### //Switch to insert mode

Keystroke	Screen	Description
“i”		The editor mode is switched to the insert mode immediately.

### //Type text

Keystroke	Screen	Description
“a” ”b” “c” “d”		The editor prints out “bcde”. “a” key is remapped to character “b” and “b” key is remapped to character “c”, and so on. See the remapping part in “rotate.c”.

### //Switch to command mode

Keystroke	Screen	Description
“Esc”		The editor mode is switched to the command mode immediately.

**//Turn on echo mode of the terminal**

Keystroke	Screen	Description
“1”	<pre> [seokin@compasslab1:~/system_programming\$ ./hw4_2014123123  insert mode! bcde command mode!  echo on! █ </pre>	Turn on echo mode of the terminal immediately.

**//Switch to insert mode**

Keystroke	Screen	Description
“i”	<pre> [seokin@compasslab1:~/system_programming\$ ./hw4_2014123123  insert mode! bcde command mode!  echo on! i insert mode! █ </pre>	The editor mode is switched to the insert mode immediately.

**//Type text**

Keystroke	Screen	Description
“a” “b” “c” “d”	<pre> [seokin@compasslab1:~/system_programming\$ ./hw4_2014123123  insert mode! bcde command mode!  echo on! i insert mode! abbccdde█ </pre>	Echo a character for each keystroke it received and print out the remapped characters.

**//Switch to command mode**

Keystroke	Screen	Description
“Esc”	<pre> [seokin@compasslab1:~/system_programming\$ ./hw4_2014123123  insert mode! bcde command mode!  echo on! i insert mode! abbccdde^[ command mode! █ </pre>	The editor mode is switched to the command mode immediately

**//Turn off echo mode of the terminal**

Keystroke	Screen	Description
“2”	<pre>[seokin@compasslab1:~/system_programming\$ ./hw4_2014123123  insert mode! bcde command mode!  echo on! i insert mode! abbccdde^[ command mode! 2 echo off!</pre>	Turn off echo mode of the terminal immediately.

**//Switch to insert mode**

Keystroke	Screen	Description
“i”	<pre>[seokin@compasslab1:~/system_programming\$ ./hw4_2014123123  insert mode! bcde command mode!  echo on! i insert mode! abbccdde^[ command mode! 2 echo off!  insert mode! █</pre>	The editor mode is switched to the insert mode immediately

**//Type some text**

Keystroke	Screen	Description
“a” “b” “c” “d”	<pre>----- [seokin@compasslab1:~/system_programming\$ ./hw4_2014123123  insert mode! bcde command mode!  echo on! i insert mode! abbccdde^[ command mode! 2 echo off!  insert mode! bcde█</pre>	The editor prints out “bcde”. “a” key is mapped to character “b” and “b” key is mapped to character “c”, and so on. See the mapping part in “rotate.c”

## //Switching to command mode

Keystroke	Screen	Description
“Esc”	<pre> [seokin@compasslab1:~/system_programming\$ ./hw4_2014123123  insert mode! bcde command mode!  echo on! i insert mode! abbccdde^[ command mode! 2 echo off!  insert mode! bcde command mode! </pre>	The editor mode is switched to the command mode immediately

## //Terminate the editor

Keystroke	Screen	Description
“q”	<pre> [seokin@compasslab1:~/system_programming\$ ./hw4_2014123123  insert mode! bcde command mode!  echo on! i insert mode! abbccdde^[ command mode! 2 echo off!  insert mode! bcde command mode! seokin@compasslab1:~/system_programming\$ █ </pre>	Terminate the editor program. Before termination, <b>terminal mode should be restored.</b>

## Late Day Policy

All homeworks are due at 11:59pm on the due date. A grading penalty will be applied to late assignments. Any assignment turned in late will be penalized 25% per late day.

## Plagiarism

No plagiarism will be tolerated. If the assignment is to be worked on your own, please respect it. If the instructor determines that there are substantial similarities exceeding the likelihood of such an event, he will call the two (or more) students to explain them and possibly to take an immediate test (or assignment, at the discretion of the instructor) to determine the student's abilities related to the offending work.