CS1020E: Data Structures and Algorithms I

Lab 4 – Text Editor
(Week 7, starting 26 September 2016)

Task Description

Have you ever imagine what is the (probable) underlying data structure that your favourite text editor use?

In this task, you will figure out yourself.

Given an initially empty text and then a long sequence of keyboard presses (to make this task doable, we limit the characters used to only lowercase alphabet characters ['a'..'z'], underscores (a more visible version of space), and four special characters '[', ']', '<', or '!'), you are asked to:

- Append the lowercase alphabet character or underscore (a.k.a. space) to the current cursor position

- Move the cursor to the first position upon encountering a '[' (imagine that this is the 'home' button)

- Move the cursor to one position beyond the last typed character upon encountering a ']' (imagine that this is the 'end' button)

- Delete the last character before the cursor upon encountering a '<' (imagine that this is the 'backspace' button), or do nothing if the cursor happens to be at the first position

- Print the current content of the text upon encountering a '!' (there are only at most **10** '!' per test case)

Input Format

Each test case is just a single line containing at least one and at most **N** keyboard presses described above.

Output Format

Print a line of output for every occurrence of character '!'.

Sample Input

```
cstentwentye_is_not<<<a_hard_module![steven_version_of_]_but_doable!
```

Sample Output

```
cstentwentye_is_a_hard_module
steven_version_of_cstentwentye_is_a_hard_module_but_doable
```

Submission

Submit C++ source file named as "list.cpp". This file MUST be of your own work!

Constraints

To get 80%, solve lab4_ex1 where **N** is just 1 000
To get full 100%, solve lab4_ex2 where **N** is 1 000 000

Plagiarism STRONG Warning

There is no skeleton file given for Lab4-Lab9 anymore, thus all CS1020E students start from a blank CPP file and thus it will be very suspicious if two different students submitted C++ code to CodeCrunch that are ~99-100% match.

Bad statistics: We have caught a total of ~15 out of 159 CS1020E students in Lab1+2+3 so far. That is, almost 10% of the cohort :(...

From Lab4 onwards, anyone else caught plagiarizing someone else code, defined as having two relatively long code submitted to CodeCrunch by two different CS1020E students and having degree of similarity very close to 100% (this similarity threshold will be progressively lowered from 99% in Lab4, 97% in Lab5, ... until 89% in Lab9), will have their entire 7% lab component set to 0.

Classic attempts at plagiarizing: Changing variable names, adding or removing comments, adding or removing indentation will not matter to our non-human plagiarism checker. So do not bother testing our system. Remember that each of your submission to CodeCrunch is archived and will be cross-checked against submissions from other students, present students AND possibly past/senior students submissions.

If you *think* that you are the better student and you want to help your friend (even from different Lab Group/Lab TA), do so in high level advice and never give your OWN C++ code to him/her.

If you *feel* that you are the weaker student and thinking about asking C++ code to your *supposedly better* student (or even a senior student), abandon that idea and just try your best. Ask your Lab TA instead who can give you a safe high level advices but will not debug your C++ code for you before deadline.

<div align="center">- End of Lab 4 -</div>