CS2810 - OOAIA: Assignment #4

IIT Madras February 6, 2017

The Last Resort

Brief Story

You are an intern working for a company that specializes in multi-faceted projects. You are associated with two teams, a backend team working on a new Distributed File System, and the frontend team which is making a GUI. There is a clash of interests between those two groups and you have to satisfy both their needs, as you are the acting bridge between the two teams. Your supervisor tells you, "You are their last resort".

Goal

You have to maintain a sorted list of files/folders, with no nesting (no tree, just a list). You are given an **unchangeable** sort() function. You need not write any sorting code. Just reuse this.

```
template <typename T, class F>
void sort(std::vector<T> &data, F cmp) {
        int L = data.size();
        for(int i=0; i<L; ++i)
                for(int j=i; j>0 && cmp(data[j],data[j-1]); --j)
                        std::swap(data[j-1],data[j]);
}
```

The sort() accepts a vector of data to be sorted and a compare *Functor* [1].

Your job is mainly to **implement** the compare *Functor* with the details that follow. And some extra code for IO.

Input Format

You are given a sequence of requests from both Backend and GUI. They will be explained later.

1. **append** requests from backend. May appear multiple times.
2. **resort** (pronounced Re-sort) requests from UI. May appear any number of times.
3. **end** for end of input. Appears only once at the end.
4. Each line is one of the following -

append <*type*> <*name*>

resort <*flag1*> <*flag2*>

end

Output Format

For each line of input, you have to print a sorted list of strings in a single line. For **end** you have to print a number (explained later). The strings are names only. No types need to be printed.

1 *Some more* URL*s* - 1 2 3 Reference

Detailed Explanation

append

- This command means you have to append a file/folder to your sorted list.
- *type* can be either file | folder
- *name* is a string with characters from `"A-Z a-z 0-9 _"`

resort

- This command means you have to Re-Sort your current list based on certain boolean flags.
- flag1 & flag2 can be either Y | N. flag1 takes priority.
  - flag1 ↔ Folders First
  - flag2 ↔ Case Sensitive
- flag1 states that all folders must be printed first in the sorted list.
  - `flag1 = Y` means print all folders first
  - `flag1 = N` means files and folders are interleaved
- flag2 is the case sensitivity of the sort after arranging according to flag1.
  - `flag2 = Y` means the sort is case sensitive
  - `flag2 = N` means the sort is case insensitive
- Relative ordering among characters is Asciibetical (ascii values are compared)
- flag1 & flag2 are initialized to N at the beginning.

compare Functor

- You have to write a **single** *stateful* Functor that can be given as a parameter to the unchangeable sort(). The compare should follow *Strict Weak Ordering* like those in **STL**.
- It should adjust its ordering based on the flags every time a **resort** appears in input.
- It should cumulatively keep track of how many times it is called.
  The number at the **end** is this number.

Sample Input

```
append folder KB9
append file 7Bw
append folder ew
append file Ln
append folder Kb9
resort Y Y
end
```

Sample Output

```
KB9
7Bw KB9
7Bw ew KB9
7Bw ew KB9 Ln
7Bw ew Kb9 KB9 Ln
KB9 Kb9 ew 7Bw Ln
20
```

"\n" here

Contest URL: https://www.hackerrank.com/ooaia4

Contest End Time: 11:45PM **today**, February 6 2017.

Submission Guidelines: Same as usual. Submit <*ROLLNO*>.cpp to moodle by 4:40PM w/ comments.