

Computer Science II — CSci 1200

Lab 6 — Generic Function Practice

Overview

This lab builds on the material on string and character manipulation from Lecture 8 and on generic functions from Lecture 9.

Create a directory for lab06 and download the following file into this directory.

http://www.cs.rpi.edu/academics/courses/fall04/cs2/lab06/lab_example.txt

Now, turn off all network connections.

Checkpoints

1. Write a complete program that reads in text and outputs (echoes) all non-blank lines. You should read a line of input using the `getline` function. You should write a function that checks to see if a line is blank. This function must demonstrate the use of the `find_if` generic function discussed in Chapter 6 of the text and discussed in the Lecture 9 notes. Use the function to determine if a string (a line of input) contains any non-whitespace characters. See the examples from the notes.

Complete this checkpoint by compiling your program, and running it from the Command Prompt as described above. Use the input file `lab_example.txt`. This will require moving this file down into the directory that contains your executable program.

2. Add a function to your program that removes all punctuation marks from each non-blank line of input and converts all capital letters to small letters. Each time this function is called it should be passed a non-blank line (string). This function should take a `const` string as an argument and return a new string. This function should use the generic function `remove_if`, together with `erase`, to remove the punctuation (again, see the Lecture 9 notes). Remember (from Lecture 8) there is an `ispunct` function whose declaration is in the header `cctype`. The program should output each string that results from this function call.

Compile and run your program on the test file provided to complete this checkpoint.

3. Add one more function to your program. This should remove all leading whitespace, trailing whitespace, and extra whitespace in a line of text after punctuation and capital letters have been removed. This function should use generic functions wherever possible. It should also use the `cctype` function `isalnum`, which returns true if a char is a letter or a digit.

Start by outlining on paper what your function has to do. Include the major steps. Then indicate, again on paper, what generic functions you need. When the TA comes to help you, s/he will want to see this first.

Compile and test your resulting program. Here's an example of what the final output should look like. For input file:

```
Why?  oh-why? Why not!!!
That's why. 1-2-3
```

```
Napoleon didn't die on Elba!!!
    Instead, he   escaped from Elba,   reclaimed   power in France, and
then   had to
        fight the British   and Prussians   at   Waterloo.
The French lost, but just barely.
    Napoleon   was exiled to   St. Helena...
```

the final output should be

```
why ohwhy why not
thats why 123
napoleon didnt die on elba
instead he escaped from elba reclaimed power in france and
then had to
fight the british and prussians at waterloo
the french lost but just barely
napoleon was exiled to st helena
```