Lab 6
Due May 31, 11:59 PM

Overview

In this lab, you will accomplish the following:

- Gain experience working with files. Specifically, you will gain experience with the open, close, read, write, and append operations on files.

- Gain experience working with other stream objects beyond `cin` and `cout`.

- Explore various techniques for handling user errors.

For this lab, it may be useful to review the following sections:

- Input/output with files

- Exceptions

ugrep

`grep` is a command line utility that allows a user to filter the contents of a file given a pattern to match against. `grep` has a lot of advanced and complicated features, but let's attempt to create a micro-version of `grep`, we'll call it `ugrep`.

Write a program that prompts the user for a file path and a phrase. Print every line in the file contains the phrase. If the file path that the user provides does not exist, print an error message and exit the program.

You should make sure that the file exists before searching through each line. You may either use exceptions or `fstream`'s `good=/=bad` methods.

Save your program as `ugrep.cpp`.

Sample Output

For these examples, I used `lorem.txt`, which can be found on Canvas.

```
File path: lorem.txt
Phrase: et
1. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Praesent
4. fringilla at. Interdum et malesuada fames ac ante ipsum primis in
5. faucibus. Cras in mi et arcu congue auctor. Aliquam lobortis interdum
6. suscipit. Mauris egestas, elit at cursus mollis, massa dolor laoreet
7. nunc, ut pellentesque libero diam id est. Ut quis tortor eget sapien
9. nisl eros, auctor ac arcu vitae, consectetur lobortis libero.
11. Quisque ac arcu dui. Cras vestibulum sagittis magna, sit amet bibendum
13. tristique metus, eu vehicula lorem magna eget nisi. Aliquam commodo
15. Maecenas consectetur lacus ac leo sollicitudin, ut iaculis quam
16. pretium. Aliquam erat volutpat. In urna sapien, fringilla eu auctor
19. non mi porttitor iaculis. Vestibulum eu augue eget sapien pulvinar
20. aliquam sit amet id nisl. Donec iaculis justo neque, a iaculis lectus
22. rutrum vel. Pellentesque commodo, turpis sit amet consequat lobortis,
27. himenaeos. Nunc non massa pharetra, hendrerit est at, blandit eros.
28. Suspendisse condimentum tincidunt diam eget volutpat. Nulla ac lacus
29. quis libero interdum consequat ac vel risus. Sed et elit sollicitudin,
30. tempus felis eget, vulputate nisl. Nam consectetur bibendum tempor.
33. id condimentum. Suspendisse potenti. Suspendisse et mi quis tellus
34. placerat dignissim. Nunc nec tortor eleifend, interdum dui et,
35. eleifend odio. Praesent in nulla vel odio consectetur consequat a nec
40. Vivamus interdum eget eros ullamcorper varius. Cras arcu nisl,
41. pulvinar et faucibus vitae, pretium eu eros. Donec eget pretium massa.
45. interdum. Donec eget dapibus erat, sed iaculis nulla. Suspendisse
46. fermentum velit et felis congue, a volutpat est ornare. Vestibulum
47. congue vulputate ex, sit amet convallis neque aliquam ac. Nunc pretium


File path: lorem.txt
Phrase: This phrase likely doesn't exist, because it isn't in Latin.
```

For this example, I am trying to open a file called `noexist.txt`, which doesn't exist on my system.

```
File path: noexist.txt
Could not open file noexist.txt
```

Receipt Formatter

The cashiers from Lab 3 were so impressed with your work that they've contracted an extension. They would like a program that allows a user to input an item name and a price for some series of items, totals the amount, and writes the contents out to a file (name of the file is entered by the user) in an easily readable table.

If the file name entered by the user already exists, the file should be completely overwritten with the new content.

Hint: Use the `setw` manipulator to get consistent spacing.

Save your program as `receipt.cpp`.

Sample Output

Console

```
Receipt file name: receipt.txt
Price: 5.23
Description: Apples
Finished? [y/n] n
Price: 6.87
Description: Bananas
Finished? [y/n] n
Price: 3.25
Description: Eggs (half dozen)
Finished? [y/n] y
```

`receipt.txt` Contents

```
Price               Description
-----               -----------
5.23                     Apples
6.87                    Bananas
3.25           Eggs (half dozen)

Total
-----
15.35
```

Submission

Share your REPL with your TA by copying the shareable link and submitting it to Canvas.

To get your shareable link, click the large **Share** button near the top of the page, then copy the URL next to **Share Link** and submit that to Canvas.

Rubric

One exercise completed	6
Second exercise completed	3
Comments	1
Total	10