Assignment 5: File Operations

CSE 330: Operating Systems - Fall 2023

Due by **17th November, 2023, 11:59 pm**

Summary

In the lecture, we are going to talk about the filesystem, a crucial aspect of operating systems that govern the organization and storage of data on various storage devices. Understanding filesystems is essential for comprehending how files are managed, stored, and accessed within a computer system.

In this assignment, we will implement some simple **C++** codes in userspace to learn how to manipulate the file on the filesystem.

This assignment is due in 7 days. You **DO NOT need to finish this assignment in your VM**, which means you can finish it on your host systems (Windows, MacOS, Ubuntu).

Description

Notes: The references in the following description contain only high-level instructions for completing the tasks of this project; they are **NOT EXACT step-by-step instructions**. To get more help, attend the lectures, ask the instructor and TAs, participate in Canvas Discussion, and use your favorite search engine (there are lots of useful materials on the web!)

In this assignment, we will implement a **C++ code** to learn how to open and read, write and close, and rename a file. You can find some online materials and learn how to use open() and close(), std::ifstream, rename(), etc. Also, you will learn how to find and replace a specific string by find() and replace().

Please follow the below steps to **finish** your Assignment 5 File Operations.

- Download the zip from the git repository: https://github.com/CSE330-FALL-2023/Assignment-5-Template
- Unzip the repository.
- Implement your **C++** code in the **file_operations.cpp** (i.e. **all //TODO part, DO NOT change any other part**).
- **Please read the Hints and TODO in the code very carefully! They tell you how to implement the code**
- Compile and test your code.

Sample Output:

```
ubuntu@ip-172-31-44-29:~/cse330/GTA-CSE330-FALL2023/Assignment-5$ g++ file_operations.cpp -o file_operations
ubuntu@ip-172-31-44-29:~/cse330/GTA-CSE330-FALL2023/Assignment-5$ ./file_operations
File created and written successfully.
Current path is "/home/ubuntu/cse330/GTA-CSE330-FALL2023/Assignment-5"
File: "file_operations"
File: "file_operations.cpp"
File: "assignment5_output.txt"

File content:
        Hello, File System!
        2023Fall CSE330
        Assignment 5
        Learning File System


Modified file content:
        Hello, Your Name!
        2023Fall CSE330
        Assignment 5
        Learning Your Name


New file name: assignment5_renamed.txt
Renamed file content:
        Hello, Your Name!
        2023Fall CSE330
        Assignment 5
        Learning Your Name


Current path is "/home/ubuntu/cse330/GTA-CSE330-FALL2023/Assignment-5"
File: "file_operations"
File: "file_operations.cpp"
File: "assignment5_renamed.txt"
ubuntu@ip-172-31-44-29:~/cse330/GTA-CSE330-FALL2023/Assignment-5$
```

Submission Requirements & Guidelines

Assignment 5 is due in 7 days by **11:59pm on 17th November, 2023**. Submit your work following the guidelines below:

1. **GitHub submission:** Submit the following (Maintain your code on the provided private GitHub repository in the CSE330 Operating Systems - Fall 2023 Organization)
   1.1. Source code of your file_operations.cpp

   1.2. README file, listing the following:
   Anything that you would like the TAs and Graders to consider for grading your submission. If your code or screenshot is wrong, TAs and Graders will grade based on your README file.

   1.3. Screenshots of the outputs.
      a. The screenshot should include the output, named as 'file_operations_output.png'

2. **Canvas Submission:** Create a .zip file with **all your submission code and files** in GitHub. Name the zip file following the below naming convention. **"Assignment-5-<Your ASU ID>.zip"**
   e.g. Assignment-5-1225754101.zip

   That means, your zip should include **file_operations.cpp + README** + **Screenshot**

3. **Do not** submit any other source code
4. **Do not** submit any binary

Policies

1. Late submissions will *absolutely not* be graded (unless you have verifiable proof of emergency). It is much better to submit partial work on time and get partial credit for your work than to submit late for no credit.
2. Every student needs to *work independently* on this exercise. We encourage high-level discussions among students to help each other understand the concepts and principles. However, a code-level discussion is prohibited and plagiarism will directly lead to failure of this course. We will use anti-plagiarism tools to detect violations of this policy.