

Project 4: Development of User-Level File System Library (libFS)

Overview

This project involves the creation of **libFS**, a user-level library that emulates key functionalities of a file system. Students will develop this library in C/C++, enabling applications to perform file and directory operations by linking with it. The library will interact with **Terminal**, a provided library that simulates disk operations, to manage data at the disk level.

Objectives

- Implement a file system library (**libFS**) in C.
- Gain practical experience with file system operations and directory management.
- Develop robust error handling mechanisms in system-level programming.

LibFS Specification

Your **libFS** implementation should encompass the following areas:

File Access Calls:

- **fileCreate**: Create a new file.
- **fileOpen**: Open an existing file.
- **fileRead**: Read data from a file.
- **fileWrite**: Write data to a file.
- **fileClose**: Close an open file.
- **fileDelete**: Delete a file.

Tasks

Create test applications to demonstrate and validate the functionality of **libFS**.

- You need to create a file call "(Your Name_Introduction).txt" by **fileCreate**.
- Your function should successfully open the .txt file by **fileOpen**.
- Your function should write your introduction into the .txt file by **fileWrite**.
- Your introduction should include at least 3-4 sentences with 2 paragraphs.
- Your function should read your .txt by **fileRead** and print the contents.
- Your function should close the file after each operation by **fileClose**.
- Your function should be able to Delete a file by **fileDelete**.
- **As a system, you should to use prompts at every step to guide users to the next operation (e.g. menu-driven approach).**
- Compile your test case with **Makefile**.
- Please include your name in all file names. (e.g. John_libFC.c, John_libFC.h, John_testFC.c)

Submission Guidelines

- Submit all materials (source code, Makefile) to **GitHub**.
- Submit the **screenshots (at least two)** of all your test results to **GitHub**.
- Submit your **GitHub** link to Canvas.