Green University of Bangladesh

Department of Computer Science and Engineering (CSE)
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File Management

Course Title: Operating System Lab
Course Code: CSE 310
Section: 213 D2

Students Details

Name	ID
Irteja Mahmud	213902016

Submission Date: 22-05-2024
Course Teacher's Name: Abdullah Al Farhad

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Lab Project Status	
Marks:	**Signature:**
Comments:	**Date:**

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Chapter 1

Introduction

1.1 Overview

The project aims to develop a comprehensive file management system as a practical component of the Operating System course curriculum. File management is pivotal in organizing, storing, retrieving, and manipulating data efficiently within computing systems. Through this project, we will gain hands-on experience in designing, implementing, and optimizing file systems, enhancing their understanding of core operating system principles.

1.2 Motivation

Efficient file management is essential for the smooth functioning of any computing system. With the exponential growth of data in modern computing environments, the need for robust file management systems has become more pronounced. This project will provide students with practical insights into designing and implementing file systems, preparing them for real-world challenges in system development and administration.

1.3 Problem Definition

The problem at hand is to design and implement a robust file management system as part of an Operating System course project. This system must efficiently handle the organization, storage, retrieval, and manipulation of files within a computing environment while ensuring data integrity, security, and optimal resource utilization.

1.3.1 Problem Statement

The FDMS project aims to address the following issues:

- Lack of intuitive interfaces for efficient organization.
- Inadequate search and retrieval mechanisms for quick data access.
- Inefficient storage utilization leading to wasted disk space.

1.3.2 Complex Engineering Problem

Designing and implementing an efficient file management system within the scope of an Operating System course presents a multifaceted engineering challenge, requiring a deep understanding of various technical domains and the ability to balance conflicting requirements. The complexity of this endeavor is characterized by several key factors:

Table 1.1: Summary of the attributes touched by the mentioned projects

Name of the P Attributess	**Explain how to address**
P1: Depth of knowledge required	Understanding of file system architecture, data structures (e.g., B-trees, inodes), disk management algorithms , concurrency control mechanisms, and security protocols.
P2: Range of conflicting requirements	Balancing performance with reliability, optimizing storage space while ensuring fast access times, and providing concurrent access to files while maintaining data consistency.
P3: Depth of analysis required	Analyzing trade-offs between different file system designs, evaluating the impact of various algorithms on system performance, and addressing potential failure scenarios and recovery mechanisms.
P4: Familiarity of issues	Students need to be familiar with issues such as file system fragmentation, disk scheduling algorithms, file locking mechanisms, access control lists, and error handling strategies.
P5: Extent of applicable codes	—-
P6: Extent of stakeholder involvement and conflicting requirements	—-
P7: Interdependence	—-

1.4 Design Goals/Objectives

Our project has the following objectives: The aim of this project is to create a user-friendly file and directory management system using shell scripting. The system will facilitate file and directory operations. Our objective is to implement a system that would be able to do the following task seamlessly.

- File Operations.
- Directory Operations.
- File Archiving.
- File Conversion

1.5 Application

The file management system developed in this project can find application in various computing environments, including personal computers, servers, cloud platforms, and embedded systems. It can serve as a foundational component for operating systems, database management systems, version control systems, and file-sharing platforms. Additionally, the project outcomes, including documentation and codebase, can serve as valuable learning resources for students studying operating systems and system software development. The FDMS project will find applications in:

- Personal Computing: Streamlining file organization for individual users.
- Business Environments: Enhancing data management for businesses
- Educational Institutions: Providing an intuitive platform for managing educational resources