File Restoration System

Mirza Khizar Baig (2024294)
Irab Zara (2024244)

github.com/21Lexar/File-Reconstruction-System

The Problem

Simulating file deletion and recovery in modern OS.

- Deletion only removes the metadata pointer
- Actual data remains on disk for potential reconstruction.

Data Structures Used

Stack

Used for recovery stack

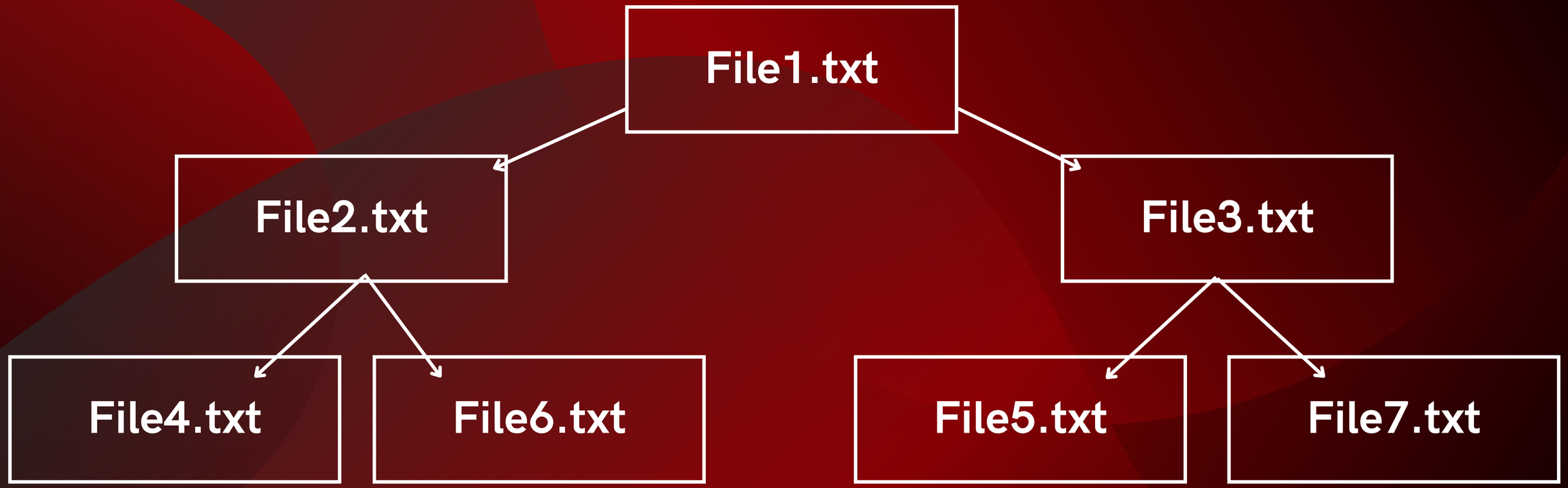
Linked List

Used for stack push() pop() operations

AVL Trees

Used for FIle Table to reduce time complexity

Active File Table using AVL Tree



Recovery History using Stack

Recovery Stack

O(1) Push & Pop Operations

Complexity Proof

- File Search : O(n)
- File Delete: O (n)
- File Recovery: O(1)

Challenges

- AVL Rotation Complexity
- DSA Constraint Violation

Future Work & Innovation

- Cryptographic Hashing
- Weighted Recovery Strategy
- Dynamic GUI

Let’s Go to our Code