

File System Simulator

A Visual Learning Tool



Objective



1. Create an interactive, visual tool for understanding complex OS concepts.
2. Bridge the gap between theoretical OS knowledge and practical application.
3. Demonstrate memory management, paging, and file allocation visually



Technology Stack

- **Programming Language:**
Python
- **GUI Framework:**
Tkinter/Streamlit
- **Version Control:** GitHub



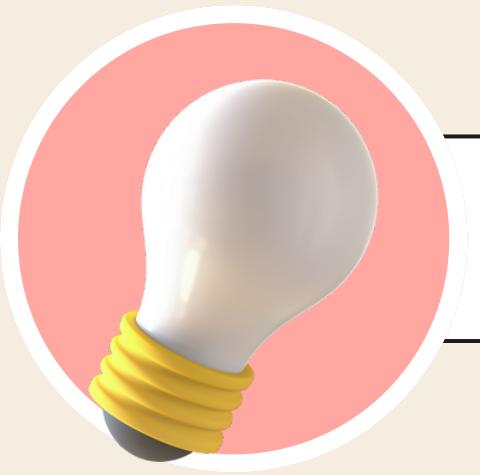
Project Idea/ Overview

Problem: OS concepts like memory management are abstract and difficult to grasp



Solution

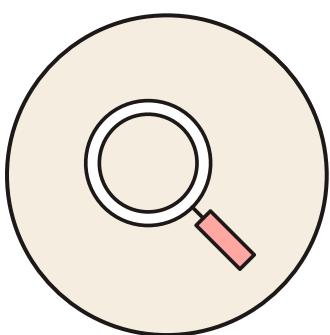
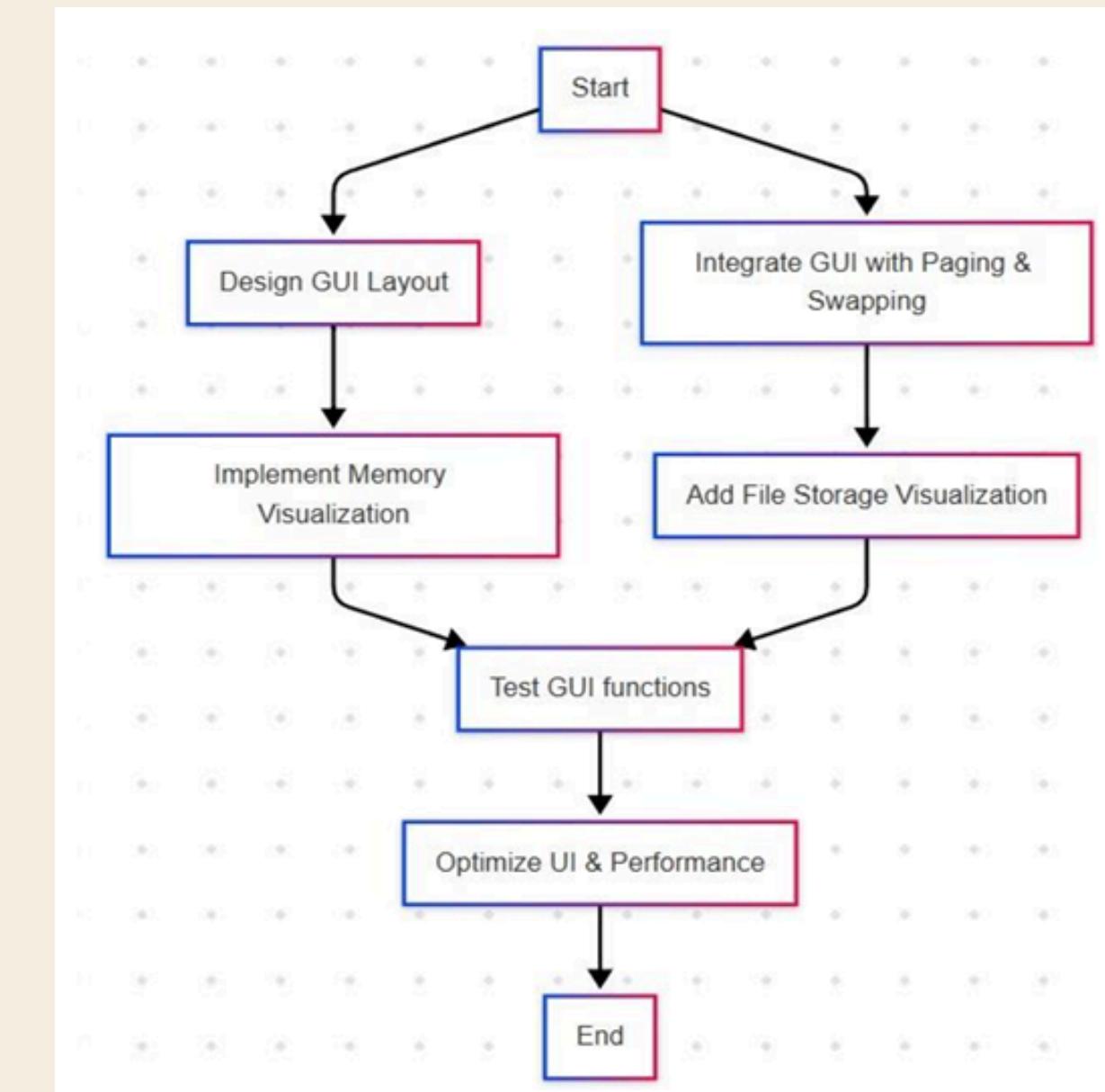
Interactive GUI simulator visualizing memory operations, page replacement algorithms, file allocation methods, and real-time system activities for enhanced conceptual understanding.



Benefits

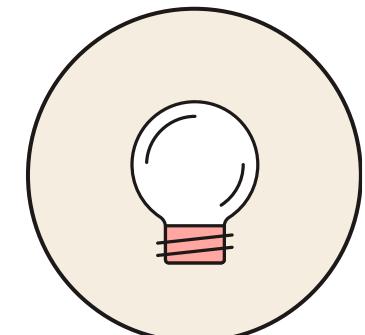
Enhanced learning experience through interactive visualization

Workflow/ Architecture



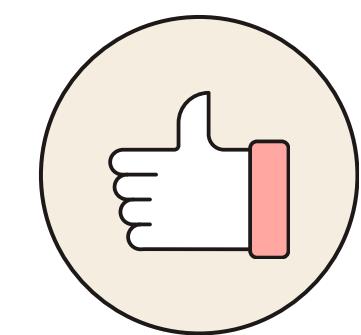
Goal # 1

Create intuitive interface for visualizing system states



Goal # 2

Implement memory management with efficient paging algorithms



Goal # 3

Develop file system with multiple allocation methods

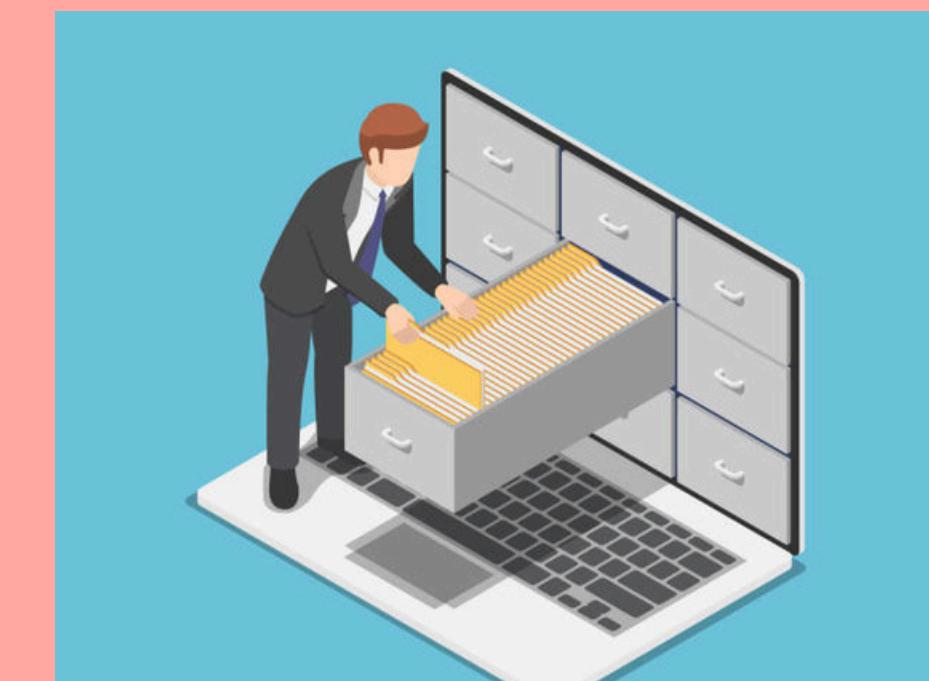
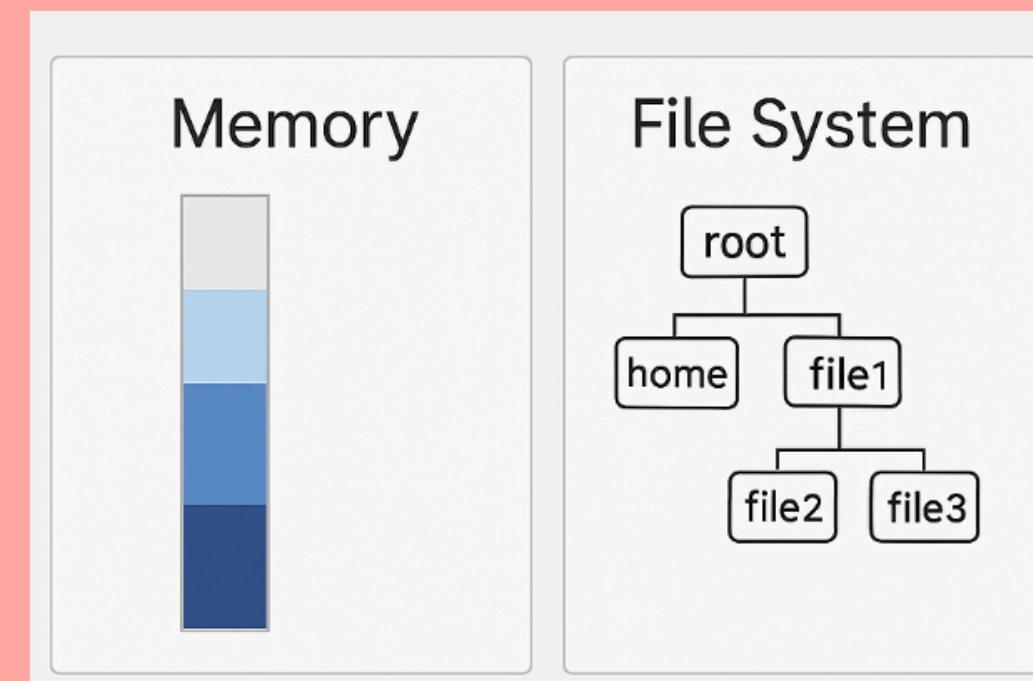
Roles and Responsibilities of Each Team Member:

Divyanshi Rasotia (GUI Developer)

- Build graphical interface using Tkinter/Streamlit
- Design memory and file system visualization components

Khushi Kumari Jha (Memory Manager)

- Implement RAM simulation and page table.
- Develop paging and swapping algorithms.



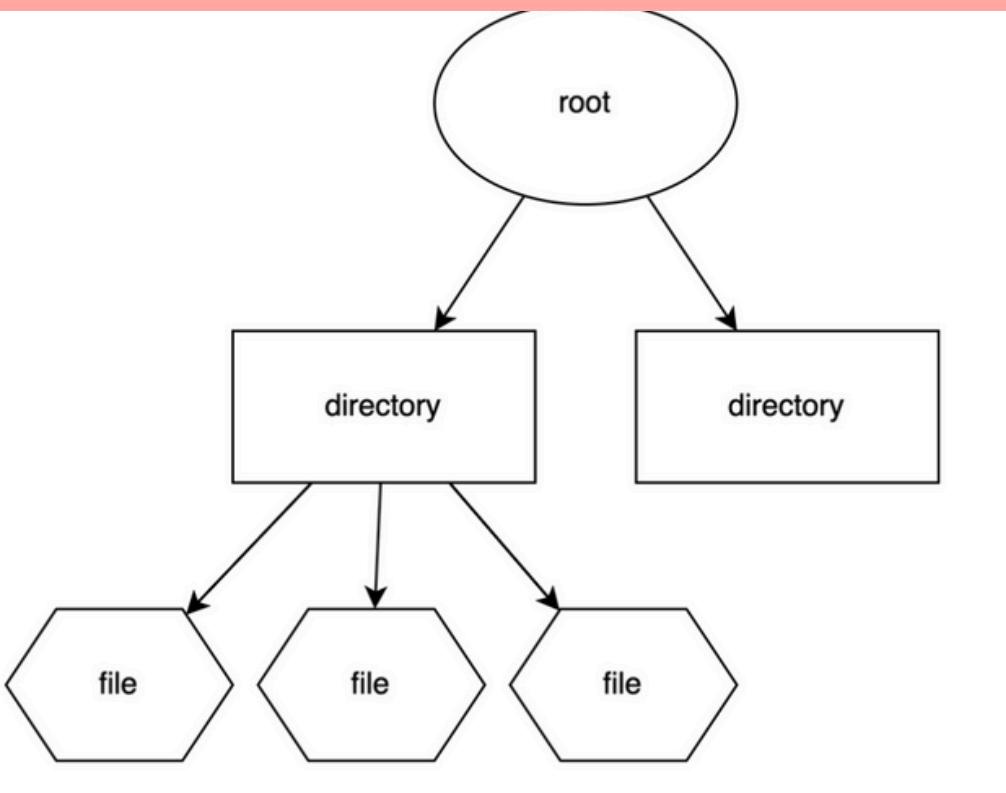
Roles and Responsibilities of Each Team Member:

Bhawna Bisht (File System Developer)

- Create file allocation methods
- Develop directory structure and file operations

Shambhavee Shukla (System Integrator & Optimizer)

- Merge components and optimize performance
- Handle final integration and debugging



References

- [1].Thekkath, C. A., Wilkes, J., & Lazowska, E. D. (1994). Techniques for file system simulation. *Software: Practice and Experience*, 24(11), 981-999.
- [2].Gupta, P., & Verma, R. (2015). File System Simulation.
- [3].Fiat, A., Karp, R. M., Luby, M., McGeoch, L. A., Sleator, D. D., & Young, N. E. (1991). Competitive paging algorithms. *Journal of Algorithms*, 12(4), 685-699.
- [4].Hoare, C. A. R. (1973). A structured paging system. *The Computer Journal*, 16(3), 209-215.