REFLECTION

Working on the project "Simulating Cache Memory Mapping and Replacement Algorithms using Git Collaboration" was a valuable and insightful learning experience that helped me connect theoretical concepts with practical implementation. Through this assignment, I gained a deeper understanding of how cache memory functions within a computer system and why replacement algorithms are essential due to limited memory capacity. Implementing the Least Recently Used (LRU) algorithm using Python allowed me to clearly observe how page hits and page faults occur during program execution and how memory content changes dynamically based on access patterns. Writing the algorithm step by step and visualizing it through flow diagrams strengthened my logical thinking and problem-solving skills.

This project also improved my understanding of Digital Fundamentals and Computer Architecture concepts such as memory hierarchy, cache behavior, and operating system decision-making. Simulating real-time memory management helped me appreciate how efficiently modern systems optimize performance. Additionally, using Git for collaboration enhanced my practical knowledge of version control, branch management, and maintaining organized project work, which are important skills for software development. Overall, this assignment was a meaningful learning experience that enhanced both my technical and analytical skills, reinforced classroom concepts, and increased my confidence in applying theoretical knowledge to real-world computing problems.