



OPERATING SYSTEM

A PRACTICAL APPROACH ON (LINUX, WINDOWS, UNIX)

Chapter 1:-

1. Basics of hardware and software
2. Knowledge of booting
3. Evaluation and categories of operating system.
4. Categories of kernel and explanation.
5. Single and multi-executable files.
6. Knowledge about different system software.
7. Knowledge on make file.

8. LAB

1. Installation process of different OS
2. Different command practice on windows and Linux.
3. Program on make file.
4. Downloading kernel and compilation of kernel.

Chapter 2:-

1. Different services of OS
2. System components
3. Different system calls for different services.
4. Program on different system call.
5. Shell Scripting
6. Programs on shell scripting

7. LAB

1. System calls implementation.
2. Shell scripting implementation.

Chapter 3:-

1. Process concept.
2. Parent and child processes
3. Different state of processes.
4. System calls related to process.
5. Process scheduling algorithms.

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6. IPC/RPC with examples.
7. Concepts on threads.
8. Creation of threads and different states of threads.
9. Thread scheduling
10. Concepts on Signal
11. **LAB**
 1. Programs on process model
 2. Programs on IPC/RPC(pipe, fifo, message queue, shared memory, semaphore, socket)
 3. Different CPU scheduling algorithm
 4. Implementation of a specific scheduling algorithm.
 5. Programs on thread model

Chapter 4:-

1. Process synchronization
2. Critical section problem.
3. Synchronization tools (file locking, mutex, semaphore, condition variable, monitor).
4. Classical problem on synchronization.
 1. Dining philosopher problem.
 2. Reader-writers problem
 3. Sleeping-Barber problem
 4. Cigarette-smoker problem
1. Deadlock handling
 2. Deadlock prevention, deadlock avoidance.
 3. Deadlock detection, Deadlock recovery
4. **LAB**
 1. Programs on different synchronization problem.
 2. Solving the above problem using synchronization tools.
 3. Banker's algorithm

Chapter 5:-

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4. Memory management Concept.
 5. Different available memory
 6. Physical and logical address.
 7. Physical and logical address space.
 8. Contiguous and non-contiguous memory allocation technique.
 9. Buddy System, Paging, segmentation, segmentation with paging.
 10. Virtual memory.
 11. Page Replacement Algorithms (FIFO,LRU,optimal page replacement Algo.)
 12. Allocation of Frames.
 13. Thrashing and demand segmentation.
 14. **LAB**
1. Static and dynamic memory allocation technique.
 2. Program over paging and segmentation.

Chapter 6:-

1. Network Management
 2. Introduction to Server/Client Model
 3. OSI and TCP Model
 4. Different protocols(TCP,IP,UDP protocols)
 5. Different classes of IP and versions
 6. **LAB**
1. Client and server programming using process model
 2. Client and server programming using thread model

Chapter 7:-

1. File management concept
2. File accessing methods.
3. File system implementation
4. Static and dynamic library and dynamic loaded library.

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5. Concept on Mass storage Device
6. Disk structure, disk scheduling, disk management.
7. Swap space management.
8. **LAB**
1. Different disk scheduling Algorithm Implementation

Chapter 8:-

1. I/O system Overview
2. I/O hardware
3. Application I/O Interface
4. Kernel I/O subsystem
5. Transferring request to hardware.

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