CSE325:OPERATING SYSTEMS LABORATORY

L:0   T:0   P:2   Credits:1

Course Outcomes: Through this course students should be able to

CO1 :: gain a comprehensive introduction to the Linux operating system, including basic commands, system calls, and file management operations, enabling them to work effectively in a Linux environment.

CO2 :: develop skills in shell programming, including handling variables, standard input/output redirection, shell arithmetic, and flow control, enhancing their ability to write efficient shell scripts.

CO3 :: perform file and directory management using system calls, allowing them to manipulate files, directories, and their attributes programmatically.

CO4 :: gain hands-on experience in implementing and managing threads and concurrency mechanisms.

CO5 :: demonstrate the ability to implement and use synchronization mechanisms such as semaphores and mutexes.

CO6 :: use inter-process communication techniques such as pipes, popen, pclose, shared memory and message passing to facilitate data exchange and synchronization between processes.

List of Practicals / Experiments:

Process creation and threading
- Creating processes
- Creating Threads
- Process duplication using fork()
- Creating threads using pthread
- Environment variables
- Replacing process image using execlp

Inter-process communication
- Pipes, popen and pclose functions
- Stream pipes, passing file descriptors
- Shared memory
- Message passing
- Remote Procedure calls

Introduction to Linux
- Basic Linux Commands: ls, cat, man, cd, touch, cp, mv, rmdir, mkdir, rm, chmod, pwd
- System Calls: Read, Write, Open
- Lseek

Synchronization
- Synchronization with Mutexes
- Synchronization with semaphores
- Race Condition

shell programming
- variables

- standard input/output redirection
- shell arithmetic
- flow control and decision making

File and directory management using system calls
- File related system calls (open, read, write, lseek, close)
- Directory related system calls (opendir, readdir, closedir etc)

Text Books:
    1. BEGINING LINUX PROGRAMMING by NEIL MATHEW & RICHARD STONES, WILEY

References:
    1. OPERATING SYSTEM CONCEPTS by ABRAHAM SILBERSCHATZ, GALVIN, WILEY

    2. UNIX CONCEPTS AND APPLICATIONS by SUMITABHA DAS, Tata McGraw Hill, India