

CA2T3: UNIX PROGRAMMING

UNIT I: Review of Unix Utilities and Shell Programming - File handling utilities, security by file permissions, process utilities, disk utilities, networking commands, backup utilities, text processing utilities, Working with the Bourne shell, What is a shell, shell responsibilities, pipes and input redirection, output redirection, here documents

UNIT II: Introduction to Shell - Shell as a programming language, shell meta characters, shell variables, shell commands, the environment, control structures, shell script examples.

UNIT III: Unix Files - Unix file structure, directories, files and devices, System calls, library functions, low level file access, usage of open, creat, read, write, close, lseek, stat, fstat, octl, umask, dup, dup2. The standard I/O (fopen, fclose, fflush, fseek, fgetc, getc, getchar, fputc, putc, putchar, fgets, gets), formatted I/O, stream errors, streams and file descriptors, file and directory maintenance (chmod, chown, unlink, link, symlink, mkdir, rmdir, chdir, getcwd), Directory handling system calls (opendir, readdir, closedir, rewinddir, seekdir, telldir)

UNIT IV: Unix Process - Threads and Signals: What is process, process structure, starting new process, waiting for a process, zombie process, process control, process identifiers, system call interface for process management, fork, vfork, exit, wait, waitpid, exec, system

Unit V: Threads & Process - Threads, Thread creation, waiting for a thread to terminate, thread synchronization, condition variables, cancelling a thread, threads vs. processes, Signals, Signal functions, unreliable signals, interrupted system calls, kill and raise functions, alarm, pause functions, abort, sleep functions. file and record locking (creating lock files, locking regions, use of read/ write locking, competing locks, other commands, deadlocks). Interprocess Communication: Introduction to IPC, IPC between processes on a single computer system, IPC between processes on different systems, pipes, FIFOs.

UNIT VI: Message Queues - IPC, permission issues, Access permission modes, message structure, working message queues, Unix system V messages, Unix kernel support for messages, Unix APIs for messages, client/server example.

UNIT VII: Semaphores - Unix system V semaphores, Unix kernel support for semaphores, Unix APIs for semaphores, file locking with semaphores. Shared Memory: Unix system V shared memory, working with a shared memory segment, Unix kernel support for shared memory, Unix APIs for shared memory, semaphore and shared memory example.

UNIT VIII: Sockets - Berkeley sockets, socket system calls for connection oriented protocol and connectionless protocol, example client/server program, advanced socket system calls, socket options.

Text Books:

1. Unix and Shell Programming, Behrouz A.Forouzan & Richard F.Dilberg, Cengage Learning 2003
2. Unix Concepts and Applications, 3/e, Sumitabha Das,

Reference Books:

1. Unix and shell Programming, Sumitabha Das, TMH
2. Advanced Unix Programming, N B Venkateswarlu, BSP
3. A Beginner's Guide to Unix, N.P.Gopalan, B.Sivaselva, PHI
4. Unix Shell Programming, Stephen G.Kochan, Patrick Wood, 3/e, Pearson
5. Unix Programming, Kumar Saurabh, Wiley,India