VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

M.Sc. (Information Technology) Programme
6th Semester Syllabus

Effective From July-2002

Paper No. : 602
Paper Title : Unix & Shell Programming [L:3,T:1]

1. Overview of UNIX
   - 1.1 Architecture
   - 1.2 Kernel
     - 1.2.1 Process
     - 1.2.2 Rebuilding Kernel
   - 1.3 Shell
     - 1.3.1 Features
     - 1.3.2 Different type of Shells and their comparison
     - 1.3.3 Command interpretation by shell
     - 1.3.4 Initialization (i.e. login) scripts
   - 1.4 Booting Process
     - 1.4.1 Boot sequence
     - 1.4.2 Boot Scripts
     - 1.4.3 Init process
     - 1.4.4.System profiles
     - 1.4.5 Booting multiple OS
2. Getting started
   - 2.1 Login process
   - 2.2 Login shell
   - 2.3 User profiles and its customization
   - 2.4 Understanding unix command structure
   - 2.5 Elementary commands like pwd, who, passwd, man, tty etc.
   - 2.6 Editor
3. UNIX services
   - 3.1 File Management
     - 3.1.1 Different type of files
     - 3.1.2 File system structure
     - 3.1.3 Path – Absolute and Relative
     - 3.1.4 File and Directory permissions
     - 3.1.5 File and directory storage strategies (i.e. structure)
     - 3.1.6 Commands related to file management like ls, rm, cat, cp, mv, touch, mkdir, rmdir, wc, chmod, chown, chgrp, ln, pg, more, cmp, diff, head, tail, sort, uniq
   - 3.2 Process Management
     - 3.2.1 Process and PCB
     - 3.2.3 Scheduling algorithm
     - 3.2.3 Process status
     - 3.2.4 Background and Foreground process

3.2.5 Signals
3.2.6 Process synchronization
3.2.7 Commands related to process management like ps, kill, trap, nice, batch, at, cron

3.3 Memory and Device Management
3.3.1 Memory management schemes
3.3.2 Shared memory
3.3.3 Memory protection
3.3.4 Overview of device management
3.3.5 Device classifications including minor and major device number
3.3.6 Device drivers

4. Shell Programming - I
4.1 Variables – User and system
4.2 Assignment statement
4.3 I/O statements
4.4 Escaping
4.5 Quoting
4.6 Redirection
4.7 Pipe
4.8 Command substitution
4.9 Command grouping
4.10 Schell script
4.11 Different ways of executing scripts
4.12 Commands like cut, paste, set, unset

5. Shell Programming - II
5.1 Positional parameters and others like $@, $*, $#, $? etc
5.2 Conditional execution (&& and ||)
5.3 Operators – arithmetic, relational, logical, file related, string related
5.4 Arithmetic manipulation – expr, let (if available in default shell)
5.5 String manipulation – expr
5.6 Statements like if, case, while, until, for
5.7 test command
5.8 Exporting shell variables
5.9 Array (if available in default shell)
5.10 Functions
5.11 Commands like eval, exec, trap

6. Filtering utilities
6.1 grep, grep and fgrep
6.2 sed
6.3 awk / nawk, gawk (which ever available)

Reference Books:

1. The design of the UNIX operating system – M.J.Bash – PHI
2. Your UNIX the ultimate Guide – S. Das – TMH
3. The complete reference Linux – Richard Peterson – TMH
4. Unix for Super User – Addison Wesly
5. The UNIX Programming Env. – Kernigh & Pike – PHI
6. C & UNIX Programming – N Kutti
7. Working with UNIX – Vijay Mukhi – BPB
8. UNIX Shells – Bourn, Korn & C – Vijay Mukhi – BPB