

UNIX/Korn Shell Programming

Intermediate and Advanced Topics

Course No.	2017
Description	This course reviews UNIX Fundamentals followed by an extensive session culminating in advanced Korn Shell programming. Students will review UNIX fundamentals, basic commands, the vi text editor, shell theory, and the directory structure. File processing command, Shell options, environment variables, and Shell programming fundamentals, will also be covered in class. Students will learn about Korn Shell programming – with a focus on interpreting and using Shell built-in variables, structure, decision and looping constructs, portability, and efficiency. The instructor will also cover Korn Shell programming constructs including line-by-line file processing, option processing, daemon development, advanced sed processing, introduction to awk, and job scheduling. This class is portable to all variants of UNIX including AIX, HP-UX, Solaris, and Linux).
Prerequisites	Introduction to UNIX and Korn Shell Programming (2016) or comparable knowledge of the UNIX system and Korn Shell Programming.
Objectives	<ul style="list-style-type: none">• Review UNIX fundamentals and Shell theory• Review Korn Shell programming fundamentals• Allow students to become more proficient with Korn Shell Advanced Topics
Major Topics	<ul style="list-style-type: none">• Overview• The Shell• The File System• The vi text editor• The environment• Communicating with User and Processes• File Processing and Regular Expressions• Miscellaneous Commands• Printing• Shell Scripting• Advanced Korn Shell• System Administration / Security
Format	Lecture and hand-on workshops
Duration	3 days



Course Contents

1. Overview

- UNIX History
- File Naming Conventions
- The Shell
- The Kernel
- The Process
- Logging in and Out
- A Few Commands (cd, echo, exit, ls, man, passwd, ps)
- The File System

2. The Shell

- Overview
- Three Shells
- Standard Command Syntax
- Locating The Proper Command
- Shell Metacharacters
- A Few Commands (alias, env, sleep, unalias, whence)
- Variable Creation and Assignment
- Exporting Variables
- Quoting Rules
- Special Characters

3. The File System

- Overview
- The File Inode
- File Type and Permissions
- Changing File Permission_____
- Setting Default File Permissions
- Changing File ownership
- Mounting and Unmounting File Systems
- Copying, Moving, Renaming Files
- Deleting and Linking Files
- Creating and Deleting Directories
- Finding Files
- File System Navigation
- A few command (chmod, chown, chgrp, cp, df, find, ln, mkdir, mount, mv, rm, rmdir, umask, unmount)

4. The vi Text Editor

- Overview
- Entering and Leaving vi
- Moving Between modes
- Command Mode
- Buffer manipulation
- Summary

5. The Environment

- /etc/profile and .profile
- System Environment Variables
- Readonly

6. Communicating with Users and Processes

- Overview
- Exec
- background Submission (&)
- fg, bg, nohip, nice
- submitting with (.)
- Wait, kill___
- write
- mesg, wall
- mail

7. File Processing and Regular Expressions

- Overview
- A Few Basic Commands (cat, more, pg, print, head, tail, file, strings)
- Redirections
- Regular Expressions
- The grep family (grep, fgrep, egrep)
- The etc/passwd file
- Piping and Filters
- sed
- tr
- Cut
- Sort
- Uniq
- Special Logical Devices (/dev/tty, dev/null)

8. Miscellaneous Commands

- Overview
- Cal, clear, date, df
- expr, fold, split, su, tee
- Time, wc, who, who am i, whoami, xargs



9. Printing

- lp Print Command Summary
- lp
- lpmove
- enable
- disable
- lpstat
- lpsched
- cancel
- accept
- reject
- lpshut
- lpadmin

10. Shell Scripting

- Overview
- Process of Creation, Permission setting and Submission
- Comments
- Built-In Environment Variables (\$\$. \$!. \$*, \$?, \$0 - \$9, \${10})
- Integer and string Operators (-gt, -lt, -ge, -le, -eq, =, !=, -n, -z)
- test
- file operators
- exit, read, shift, echo, &&, ||
- if, then, else, elif, fi
- case, in, ::, esac
- while, do, done,
- until, do, done,
- true, false
- for in do, done
- break, continue
- Korn shell Specifics
- Let
- Arrays
- RANDOM

11. Advanced Korn Shell

- Overview
- Job Scheduling
- cron tables
- cron permissions
- batch
- at
- daemon skeleton
- option processing / getopt
- sed, buffers, printf, looping
- parameter substitution
- Extended Korn Shell Expressions
- awk

12. System Administration / Security

- Tcp-ip /ftp

Appendix A UNIX Command

- Reference Sheet

Appendix B Table of ASCII

- Characters

