UNIX/Linux Fundamentals and Shell Scripting

Introduction to UNIX

- Design Philosophy
- System Components
- The Shell and Command Entry
- Documentation

Text Editing

- Types of Editors
- From `ed` to `ex` to `vi`
- Basic Editor Tasks with `vi`
- Editing Multiple Files
- Named Buffers
- `vi` Startup File

The File System

- File System Organization
- File Types
- File and Directory Naming Rules and Conventions
- Commands for Navigating the File System
- Introduction to Inodes
- Ownership, Permissions, and Dates
- Manipulating Files and Links
- Manipulating Directories
- Determining Disk Usage
- Other File System Utilities

Printing

- Printing Under AT&T UNIX
- Printing Under BSD UNIX

Shell Programming

- Shell Script Features and Capabilities
- Creating and Running a Script
- Working With Variables
- Environment Variables
- Working With Data Types
    - Formatting
    - Base Conversion
    - Setting Special Attributes
- Input/Output Techniques
- Conditional Constructs

Basic User Commands

- Logging In and Logging Out
- Command Line Editing
- Navigating the File System
- Viewing and Copying Files
- Controlling the Terminal
- Sending and Receiving Mail

UNIX Processes

- The UNIX Process Model
- Process States
- Monitoring and Controlling Processes

Introduction to Shells: `sh, bash, and ksh`

- Shell Functions
- I/O Redirection and Pipes
- Command Separation and Grouping
- Background Execution
- Filename Expansion
- Shell Variables
- Command Substitution
- Quoting and Escaping Metacharacters
- Bash Shell Features
- Korn Shell Features
- Command Execution
- Startup Files
- Customizing the User Environment

Multitasking and Batch Processing

- Multitasking
- Scheduled Execution Using `cron`
- The `at` and `batch` Commands

Advanced Shell Features

- Manipulating Strings
- Writing and Calling Functions
- Controlling Process Priorities
- Interpreting Command Line Arguments
- Making Scripts Interactive
- Special Shell Variables
- Advanced I/O with Streams
- Improving Performance of Scripts

- - if/then
    - else/elif
  - Looping Constructs
    - for, while, until
  - Math Operators

Text Manipulation Utilities

- Editing a File from a Script
- Scripting with ed or sed
- UNIX and Linux Utilities to Manipulate Files
- Regular Expressions
- grep and egrep
- The Stream Editor sed
- Sorting in Scripts
- Generating Reports with awk
- Splitting Large Files
- Counting Words, Lines, and Characters
- Transforming File Contents
- Extracting Text Strings

Backing Up Files

- Backup Media
- UNIX Device Names
- tar and cpio
- File Transport and Conversion with dd

File Processing Utilities

- Examining and Comparing Files
- Reporting Differences Between Files
- Comparing Files of Any Format
- Displaying Data in Octal and Hex
- Compressing Data
- Converting File Formats

Networking Commands

- UNIX Network Applications
  - Remote Execution Commands
  - Remote Activity Reporting
  - Communicating with Remote Users
- Internet Applications
  - ftp, tftp, telnet
- Remote Access Control Mechanisms
- Using the Secure Shell (ssh)