

Shell Scripting Syllabus



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Shell Scripting Syllabus

1. Introduction to Shell Scripting

- What is Shell Scripting?
- Types of Shells (Bash, Korn, Zsh, etc.)
- Basics of Linux/Unix File System
- How to Write and Execute Shell Scripts
- Understanding the shebang (#!) Line

2. Shell Commands and Utilities

- Common Linux/Unix Commands (ls, cat, grep, awk, sed, etc.)
- File and Directory Management
- Working with Text Files
- I/O Redirection and Piping
- Permissions and Ownership (chmod, chown, etc.)
- Environment Variables and Configuration

3. Scripting Basics

- Variables and Data Types
- Input and Output (Reading User Input, Displaying Output)
- Quoting Mechanisms (Single, Double, and Escape Characters)
- Comments and Debugging Basics

4. Control Structures

- Conditional Statements (if, else, elif, case)
- Loops (for, while, until)
- Nesting Loops and Conditionals
- Break and Continue Statements

5. Functions in Shell Scripts

- Writing and Using Functions
- Function Arguments
- Scope of Variables (Global vs Local)
- Return Values

6. Advanced Shell Scripting

- Working with Arrays
- String Manipulations
- Regular Expressions and Pattern Matching
- Process Management (ps, kill, jobs, bg, fg, etc.)
- Signals and Traps (trap command)

7. File Handling

- Creating, Reading, and Writing Files
- File Comparisons
- Archiving and Compressing Files (tar, gzip, zip)
- Automating File Backups

8. Scripting with Tools

- Using awk for Text Processing
- Advanced sed for Stream Editing
- Working with cut, sort, uniq, diff

9. Error Handling and Debugging

- Logging and Debugging Techniques
- Using set and trap for Error Handling
- Handling Exit Status (\$?)

10. Scheduling and Automation

- Scheduling tasks with cron and at
- Writing Scripts for System Administration
- Automating Routine Tasks

11. Networking and Shell Scripting

- Basics of Networking Commands (ping, netstar, curl, wget)
- Writing Scripts for Networking Monitoring
- FTP and SCP Automation

12. Scripting for System Administration

- User and Group Management
- Disk Usage and Monitoring
- Automating Software Installation

13. Debugging and Optimization

- Using shellcheck for Script Analysis
- Performance Optimization Tips
- Testing and Validation of Scripts

14. Version Control for Scripts

- Introduction to Git
- Managing Script Versions with Git

15. Real-World Applications

- Writing Backup Scripts
- Automation of Deployment Tasks
- Monitoring System Health
- Building Interactive Menus in Scripts

16. Project and Capstone

- Real-World Shell Scripting Project
- Building Comprehensive Automation Scripts
- Peer Review and Feedback