

Bash Scripting: awk, sed & Regular Expressions

Learn to write and debug Bash shell scripts, using variables, loops, functions and traps, plus awk, sed and regular expressions.

24

MODULES

153

TOPICS

19

HANDS-ON ACTIVITIES

COURSE OVERVIEW

This course covers the Linux environment and basic commands before moving into shell scripting fundamentals, including variables, arrays, user input and program output. It then addresses shell arithmetic, branching, patterns, looping, the getopts command, functions, and traps and signals for script control. The course also introduces awk and sed for text and record processing, applies these skills in utility scripts, and covers expressions, compound commands and shell security. It closes with a dedicated module on awk programming, covering pattern matching, control-flow statements and formatted output.

WHO THIS COURSE IS FOR

Linux Administrators

Shell Script Developers

System Administrators

DevOps Engineers

Support Engineers

LEARNING OBJECTIVES

- Explain the Linux file system, directories and file types
- Apply command-line editing, history and directory commands
- Configure shell aliases, prompts and key bindings
- Develop shell scripts using variables, arrays and user input
- Apply shell arithmetic, branching and looping constructs
- Implement functions, traps, signals and script scheduling
- Apply regular expressions and patterns with grep and egrep
- Develop text-processing scripts using awk and sed

24 Modules, 153 Topics

01

Lab Session

The Linux Environment

TOPICS

The Origin of Linux · Files and File Systems · Directories · Inodes and Links · Pipe and Socket Files · Device Files

02

Lab Session

Basics of Linux

TOPICS

Command Basics · Command-Line Editing · Multiple Commands · Multiline Commands · Command History · Directory Commands · Basic file permissions

03

Lab Session

Working with Files and Users

TOPICS

Listing Files · Getting Help · Fixing the Display · Working with Files · Working with People

04

Lab Session

Working with Shell

TOPICS

- What is a shell?
- Types of shell
- Shell features
- Shell Aliases
- Customizing Your Prompt
- Built-In Versus Linux Commands
- The Bash Hash Table
- The Set and Shopt Commands
- Key Binding

05

Lab Session

Script Basics

TOPICS

Which shell? · Recommended shell · Pseudo code before writing shell script · Creating a Script · Magic Sha-Bang · How to execute a script · Exit status · Shell Debugging Features

06

Lab Session

Variables

TOPICS

Introduction to Variables · Variable Assignment · Displaying and using variables · Variable Attributes · Quoting Variables · Escape Characters · The eval Command · Concatenation and sub-strings

07**Lab Session**

Array Variables

TOPICS

Creating array Variable · Substituting and counting · Using integer variables as element numbers

08**Lab Session**

User Input

TOPICS

Reading user input · Positional parameters · Creating positional parameters

09**Lab Session**

Designing Program Output

TOPICS

Variable attributes · Formatted output with printf · Terminal echo · I/O Redirection · Pipe and tee

10**Lab Session**

Managing Input and Output

TOPICS

- File descriptors
- Reading / writing using file descriptors
- Redirecting, parameter lists and 'here' documents
- Creating parameter lists from input lines

11**Lab Session**

Shell Arithmetic

TOPICS

Creating Integer Variables · Using arithmetic operators and data

12**Lab Session**

Branching and Logic Testing

TOPICS

Logic testing · Conditional operators · Multi-way branching and the 'case' statement

13**Lab Session**

Shell Patterns

TOPICS

Basic expressions · Regular expressions · Meta-characters · Pattern combinations · Using Character Classes · The grep and egrep command

14**Lab Session**

Looping

TOPICS

The 'while' loop · The 'until' loop · The 'for' loop · Breaking out of a loop and continuing · The 'select' loop

15

Lab Session

The 'Getopts' Command

TOPICS

Processing arguments · The getopts and OPTARG variable · The OPTIND variable

16

Lab Session

Functions

TOPICS

Displaying current shell functions · Declaring and using functions · Variable scope · Function recursion

17

Lab Session

Traps, Signals and Script Control

TOPICS

Common signals · Running Scripts in Background Mode · Scheduling your script · Starting the Script at Boot Time · The trap commands

18

Lab Session

Introduction to 'Awk'

TOPICS

Record processing · Pattern matching and relational expressions · Command line arguments

19

Lab Session

Introduction to 'Sed'

TOPICS

Substituting text · Deleting and printing lines · Reading and writing files · Multiple 'sed' editor functions

20

Writing Utility Scripts

TOPICS

Creating Graphical Script · User Management Script · Directory Monitoring Script · User Login Monitoring Script · Email Report by Script

21

Expressions

TOPICS

- Basic if command
- let Features
- File test operators
- Arithmetic comparison operators
- String comparison operators
- Arithmetic comparison with double parentheses
- Parameter substitution and expansion
- Brackets and Extended brackets test construct
- Curly brackets construct
- Parentheses and double parentheses
- Regular expression
- Extended regular expression
- POSIX character classes
- Globbing options
- Here Documents
- Logical expressions

22

Compound Commands

TOPICS

Command Status Codes · if Command · case Command · while Loop · until Loop · for Loops · Embedded let · Grouping Commands

23

Shell Security

TOPICS

- The Basic Linux Security Model
- Knowing Who You Are (id)
- Transferring Ownership (chown/chgrp)
- Changing Access Rights (chmod)
- Default Access Rights (umask)
- setuid/setgid and Scripts
- The chroot Command
- Resource Limits (ulimit)
- Restricted Shells
- Secure File Deletion

24

Awk Programming

TOPICS

- Getting Started
- The Structure of an AWK Program
- Running an AWK Program
- Computing and Printing
- Printing Line Numbers
- Putting Text in the Output
- Sorting the Output
- Selection by Text Content
- Combinations of Patterns
- BEGIN and END
- Computing with AWK
- Computing Sums and Averages
- String Concatenation
- Built-in Functions
- Counting Lines, Words, and Characters
- Control-Flow Statements
- Expressions as Patterns
- String-Matching Compound and Range Patterns
- Regular Expressions
- The printf Statement
- Output into Files

Practise What You Learn

#	MODULE	ACTIVITY
01	The Linux Environment	The Linux Environment
02	Basics of Linux	Basics of Linux
03	Working with Files and Users	Working with Files and Users
04	Working with Shell	Working with Shell
05	Script Basics	Script Basics
06	Variables	Variables
07	Array Variables	Array Variables
08	User Input	User Input
09	Designing Program Output	Designing Program Output
10	Managing Input and Output	Managing Input and Output
11	Shell Arithmetic	Shell Arithmetic
12	Branching and Logic Testing	Branching and Logic Testing
13	Shell Patterns	Shell Patterns
14	Looping	Looping
15	The 'Getopts' Command	The 'getopts' Command
16	Functions	Functions
17	Traps, Signals and Script Control	Traps, Signals and Script Control
18	Introduction to 'Awk'	Introduction to 'awk'
19	Introduction to 'Sed'	Introduction to 'sed'

WHAT IS INCLUDED

Everything You Need to Succeed

- Koenig course material for every module
- Delivery by certified instructors and subject matter experts
- Hands-on exercises throughout the course
- Course completion certificate from Koenig

ABOUT KOENIG

Who We Are

Established in 1993, Koenig Solutions is a globally recognised training provider with 35+ technology partnerships, 5,000+ training programmes and a network of certified instructors and subject matter experts, supporting individuals and enterprise teams worldwide.

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